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REPORT

ON

LOCATION AND UTILISATION

OF

WASTELANDS IN INDIA

PART I—PUNJAB

WASTELANDS SURVEY AND RECLAMATION
COMMITTEE

(MINISTRY OF FOOD AND AGRICULTURE)
GOVERNMENT OF INDIA
SEPTEMBER, 1960

into the following two categories :—

(*a*) Lands which are really adjuncts of village *abadis* and are meant to serve as pastures and fuel forests or sites for the extension of *abadis*, and

(*b*) Lands in large-sized blocks which have either gone out of cultivation or have never been brought under cultivation.

2. With a view to utilising the latter category of lands which afford the greatest promise for increased agricultural production, the Government of India constituted a Committee, *vide* their letter No. F/1024/Spl/59, dated the 11th June, 1959, (Appendix A) with the following terms of reference :—

(*i*) to make a survey of land classified as other uncultivated land excluding "fallow lands" and fallow lands other than current fallows" and locate areas where large blocks of land are available for reclamation and resettlement,

(*ii*) to suggest suitable measures for reclamation according to conditions in different areas and estimate the cost of reclamation and colonisation and the financial assistance and agricultural extension and training necessary for the settlers (the settlements being made on a co-operative basis),

(*iii*) to suggest the terms and conditions upon which settlement should be made, the areas to be allotted and the payments to be made by settlers' co-operative, and

(*iv*) to estimate the economic aspects of such reclamation in terms of the expenditure involved, the likely addition to food production and the employment and income that would become available to settlers and their families and to lay down the priorities *inter se* between different categories of reclaimable lands.

3 In order to ensure effective co-ordination and speedy completion of the work, each State Government/Union Territory was asked by the Government of India to appoint a fairly senior officer who would be able to devote sufficient time to the work of the Committee, help it in collecting the necessary information and carry on correspondence with it. This procedure facilitated the work of the Committee to a great extent in obtaining relevant data from the State Governments and in arranging the tours.

4. The Committee held its first meeting on the 7th July, 1959, when it discussed the plan of work and the staff requirements. In the second meeting held on 4th August, 1959, a draft questionnaire was discussed and finalised. The questionnaire (Appendix B) was issued to all the State Governments and Union Territories, with a request that their replies should be forwarded to the Committee by the 25th September, 1959. This questionnaire sought information mainly on the availability of wastelands in blocks of 1,000 acres or more and the prospects or resettlement in each State. Subsequently, as a result of the Committee's discussions with the Liaison Officers of the Punjab and Madhya Pradesh, it was felt that the availability of wastelands in blocks of 1,000 acres or more might be limited and it was decided to obtain detailed information in respect of all blocks of wastelands measuring 250 acres or more. Accordingly, a letter was issued to all the State Governments (Appendix C) asking for this information.

5. It was laid down in the terms of reference that the Committee should complete its work and submit its proposals in respect of one State in about a month and then proceed to take up investigation in another State. The Committee, however, felt that such a procedure was neither feasible nor advisable as the different State Governments did not have the information required by the Committee readily available and the process of collection took some time. In some cases, special surveys had to be organised. The Committee, therefore, decided that it might take up investigations in respect of the following eight States together in the first phase, viz., Punjab, Madhya Pradesh, Bihar, Kerala, West Bengal, Orissa, Andhra Pradesh and Mysore, and submit reports for each State one after another and then take up the remaining States. But for this procedure, the work of the Committee would have been very much delayed.

6. Accordingly, the report for the Punjab is being submitted first. This will be followed by reports in respect of the other States. A general report covering the entire country will then be presented which, *inter alia*, will deal with priorities between the different categories of reclaimable lands in the different States.

7. The report for each State will be divided into four sections. Section A will contain general observations about the State regarding its climate, soils, crops grown, irrigation facilities available, etc. Section B will deal with the areas offered for reclamation, their general characteristics, measures necessary for bringing the wastelands under cultivation, and the cost of reclamation. Section C will contain suggestions for follow-up and resettlement operations, if any, the estimated additional production from the reclaimed areas, and priorities between the different categories of reclaimable lands. In Section D, a summary of general conclusions and recommendations will be presented.

lands classified as "other uncultivated lands excluding fallow lands" and "fallow lands other than current fallows", and locate large blocks for reclamation and resettlement.

9. In order to avoid ambiguity in the appraisal of the lands available in each of the above two categories, it is necessary to define the two terms. The classification of land-use adopted by the Directorate of Economics and Statistics, Union Ministry of Food and Agriculture, is nine-fold as under :—

(*i*) forests,
(*ii*) barren and unculturable lands,
(*iii*) land put to non-agricultural uses,
(*iv*) permanent pastures and meadows,
(*v*) areas under miscellaneous trees and crops,
(*vi*) culturable waste,
(*vii*) current fallows,
(*viii*) fallows other than current fallows, and
(*ix*) net area sown.

The lands classified under categories (iv), (v) and (vi) are grouped together and designated as "other uncultivated lands excluding fallow lands". The category "culturable waste" is defined to include all lands available for cultivation but not taken up for cultivation or abandoned after a few years for one reason or the other. Such lands may be fallow for more than five years and may be covered with shrubs and jungle. They may be assessed or unassessed and may lie in isolated patches or blocks or within cultivated holdings. Lands reserved as pastures for grazing are not included under "culturable waste". Similarly, fallows of one year are classified as "current fallows", while those of 2-5 years are classified as "fallows other than current fallows". Lands left for growth of miscellaneous trees like bamboo, casuarina, fuel trees, etc. are not classified as "culturable waste".

10. Although the classification suggested by the Ministry of Food and Agriculture has been adopted in all the States, the Committee was informed during the course of discussions with the State officials that the concept of "other uncultivated lands excluding fallow lands" was not yet clearly understood. Lands which were classified as "culturable waste" at the time of settlement some years ago still continue to be shown as such in the revenue records even though they cannot be made culturable after incurring any reasonable expenditure. Similarly, some of the lands which are culturable continue to be classified as barren and unculturable or pasture lands. In some other cases, the pasture lands have been included in the category of culturable waste. Further, the category "other uncultivated lands excluding fallows" is

treated as a sort of residual class in which are included all lands not accounted for under any other class.

11. In view of these considerations, we are of the view that the areas included in the two categories, viz., "other uncultivated lands excluding fallow lands" and "fallow lands other than current fallows" may not fairly represent the actual extent of culturable wastelands in the country, and accordingly much reliance cannot be placed on the statistics supplied by the different State Governments. The mere collection of statistics under the head "culturable waste" can serve but little purpose unless detailed information on the types of wastelands available in each State, the ownership of such lands, their availability in sizeable blocks and the cost of reclamation measures is available. We were glad to note that some of the States had realised the importance of collecting such statistics and had either started the necessary surveys or were preparing to do so for achieving the above object. This is a step in the right direction and any assistance that the Central Government can give in this matter will greatly facilitate the collection of vital statistics on proper land use. For the purpose of our report, we have relied on the data furnished to us by the revenue/agricultural agency of each State.

12. As regards resettlement, the terms of reference of the Committee enjoin upon it to locate areas where large blocks of land are available for reclamation and resettlement. We consider that the resettlement work is not the be-all and the end-all of our labours and that the main job is to locate lands which can be reclaimed and brought under the plough for increasing the food resources of the country. We have, therefore, suggested resettlement schemes only in cases where food production would be hindered without resettlement work.

13. We have viewed the entire problem mainly from an agricultural angle, but at the same time, we have tried to deal with matters which go beyond the purely agricultural aspects of the subject, for we do recognise that the problem of utilisation of wastelands involves not merely the adoption of agricultural techniques but an appreciation of a variety of human and social aspects.

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The report deals with the availability of wastelands in large-sized blocks in the Punjab and the measures to be taken for their reclamation.

2. With a view to acquiring some knowledge of the wastelands in the State, we undertook tours of certain representative areas. It was, however, not possible to visit all the areas offered for reclamation, nor was this considered necessary.

3. On the first visit between the 2nd and 4th November, 1959, the Bhunar-Kheri area in the Patiala district where land reclamation work had been carried out in the previous years, and the Guhla area in the Karnal district where work was in progress, were inspected. A preliminary discussion between the members of the Committee and the officials of the Punjab Government was held at Chandigarh on the 3rd November, 1959. During the second visit of the Committee from the 16th to 18th November, 1959, we examined wastelands in the districts of Amritsar and Jullundur. During the third visit on the 14th and 15th December, 1959, the Committee had discussions at Amritsar with the Director, Irrigation and Power Research Institute, the Superintending Engineer, Upper Bari Doab Canal Circle, and the Deputy Commissioner, Amritsar, on the problems of reclamation and provision of irrigation facilities in the riverain areas. On the 22nd August, 1960, the draft report of the Committee relating to the State was discussed and finalised.

4. We wish to express our gratitude to the officials of the Punjab Government who gave us the benefit of their views. We wish to thank particularly the Liaison Officers, Shri S. S. Bedi and Shri Harkishen Singh Minhas, for obtaining the necessary data required by the Committee, and Sardar Hakim Singh, Assistant Director of Agriculture (Reclamation), and Dr. J. S. Kanwar, Agricultural Chemist to the Punjab Government, for carrying out a special survey in order to locate the wastelands in the State.

5. We are highly indebted to Dr. S. P. Raychaudhari, Chief Soil Survey Officer, Indian Agricultural Research Institute, for furnishing the data on the soils of the State, and for allowing us to make use of the facilities at the cartographic laboratory of the Institute in printing the maps included in the Report.

PART I

THE PUNJAB

SECTION A

(General aspects)

General aspects

The State of Punjab is divided into 19 districts, namely, Hissar, Rohtak, Gurgaon, Karnal, Ambala, Simla, Kangra, Hoshiarpur, Jullundur, Ludhiana, Ferozepore, Amritsar, Gurdaspur, Bhatinda, Kapurthala, Mohendargarh, Patiala, Sangrur, and Lahaul and Spiti. These districts comprise 73 tehsils and 21,516 villages.

2. The total population of the Punjab, according to the 1951 census, is 16,135,000, which gives an average density of 340 persons per square mile as against the average density of 287 for the country as a whole. The agricultural population forms 65 per cent of the total, with a concentration of about 80 per cent in the rural areas. The non-agricultural communities are mainly concentrated in the Ambala, Ludhiana, Jullundur and Amritsar districts. The peasant-proprietors constitute about 60 per cent of the agricultural population, tenants are about 1/3rd of the peasant-proprietors, and the agricultural labourers just a little over 1/6th. The non-cultivating owners are about four per cent of the total.

3. The State of Punjab can broadly be divided into three principal physical divisions as follows :—

- (*i*) The Himalayan Region (mountainous tract);
- (*ii*) The Sub-Himalayan Region (sub-montane tract); and
- (*iii*) The plains (alluvium) comprising —
  - (*a*) Eastern plains.
  - (*b*) Western plains.

4. The mountainous tract consists of slopes and valleys of the parallel ranges of the Himalayas and the Shiwalik hills, Kasauli, Dagshai and Subathu series.

5. The sub-Himalayan region intervenes between the lesser Himalayas and the plains. They form a system of low foot-hills corresponding to the Shiwalik ranges and are composed entirely of tertiary and principally of the upper tertiary, sedimentary river deposits.

6. The plains consist of alluvium of the Indo Gangetic origin. Approaching south and south-west in the plains, severe aridity prevails. The Great Indian desert makes an entry into these confines of the plains of the State.

Climate

7. The Punjab is an inland State and the climate over the greater part is of the most pronounced continental character, extreme summer heat alternating with severe winter cold. The greater portion of rainfall occurs in summer from June to September, while the winter rains are received from December to February. Precipitation decreases as the distance from the Himalayas increases. The presence of the mountainous and sub-montane zones largely modifies the temperature and other climatic factors in different parts of the State. The annual rainfall in the mountainous region is as high as 100 inches, but it decreases as we proceed to the south-west, being as low

as 10 inches in some parts of the Hissar district. Temperature also varies greatly. It is as high as 120 F in the plains and as low as 27° F in the mountainous region. The State has thus been divided into six climatic zones as follows based on the amount of annual precipitation (*vide* Map I) :—

Zone	Annual rainfall (inches)
I	70—100
II	40—70
III	30—40
IV	20—30
V	10—20
VI	below 10

Soils

8. The large variations in climate produce great changes in the soils of the different regions of the State. The distinguishing characteristics of these soils are as given below :—

Chemical characteristics	Climatic zones					
	I	II	III	IV	V	VI
Calcium carbonate %	Nil	0·16	0·17	0·24	1·04	2·30
Organic matter %	1·11	1·00	0·80	0·53	0·50	0·23
Total nitrogen %	0·16	0·08	0·06	0·04	0·04	0·02
pH	5·30	6·50	6·80	7·73	8·35	8·77

9. The soils in the hilly regions are acidic to neutral in reaction and contain little soluble salts. On account of arid conditions prevailing in the plains, there are large accumulations of salts in the soils which show marked alkaline reaction. *Kankar* formation has also taken place at most of the places in the plains.

10. According to the morphological, physico-chemical and chemical characteristics of the soil profiles studied in the different meteorological divisions of the State, the soils can be classified into the following recognised world groups :—

SOIL ZONES OF THE PUNJAB

(Based on rainfall-temperature complex)

Details	Soil zones				
	I (Per-humid)	II (Humid)	III (Semi-humid)	IV (Semi-arid)	V & VI (Arid)
Rainfall (inches) ..	123·13	40·96	29·83	24·36	11·16
Lang's rain factor ..	137·00	38·80	31·40	29·80	11·60
Meyer's N. S. quotient	869·50	222·20	55·50	17·50	—
Soil group description	Pedalfer, black-coloured soil of podsol group, solum 36″	Transitional soil of alluvium origin.	Pedocal, chestnut-coloured soil of alluvium origin, solum 120″.	Pedocal, brown-coloured soil of alluvium origin, solum 54″.	Pedocal, sierozem of alluvium origin, solum 36″.

11. Map I shows the soil zones of the Punjab based on the rainfall-temperature complex (*vide* paras 8—10). The important crops grown in the different zones are as below :—

	Crops
Zone I (Per-humid)	Tea, paddy, wheat, maize, potato and vegetables.
Zone II (Humid)	Wheat, maize, paddy, gram, sugar-cane, cotton, groundnut, potato and vegetables.
Zone III (Semi-humid)	Wheat, barley, maize, paddy, gram, sugarcane, groundnut, cotton, potato and vegetables.
Zone IV (Semi-arid)	Wheat, barley, maize, bajra, gram, groundnut, sugarcane, potato and vegetables.
Zones V & VI (Arid)	Wheat, maize, bajra, gram, groundnut, potato and vegetables.

12. Large tracts in the Punjab (at a moderate estimate of 3.2 million acres) are lying waste and are rendered unproductive due to the development of salinity and alkalinity in the soil. The affected lands are locally known as *kallar, halrathi, reh, usar, thur,* etc. The extent of such lands is increasing rapidly and the areas which once used to grow good crops are becoming barren. Due to the rise in the water-table of the land which followed in the wake of intensive irrigation, large tracts in the Ferozepore, Amritsar, Gurdaspur, Bhatinda, Patiala, Rohtak, Karnal and Hissar districts have been rendered unsuitable for cultivation. It is estimated that about 9.3 million acres of land in the State suffer from water-logging in varying degrees of severity, and every year the water-table of the land is rising at the rate of 6 to 12 inches (*vide* Map IA). Drainage of water-logged areas has thus become an urgent problem in order to restore the affected lands to their former level of productivity.

Irrigation

13. The gross and net irrigated areas in the State during 1955-56 were 9 and 8 million acres respectively, representing 38 and 34 per cent of the area sown. The principal source of irrigation is Government canals constituting 63 per cent of the net irrigated area. Private canals account for an area of about 2 per cent and wells about 34 per cent. Only one per cent of the area is irrigated by tanks and other sources.

14. The extent of irrigation varies from district to district, according to the location of the water sources and the depth of the water-table. In 1953-54, as much as 88 per cent of the cropped area in Amritsar received irrigation, 67 per cent in Ferozepore, 64 per cent in Jullundur and 62 per cent in Ludhiana, while for the districts of Ambala, Hoshiarpur, Gurgaon and Hissar the figures were 9, 13, 18 and 21 per cent respectively.

Natural vegetation, crops grown and yields obtained

15. *Hilly regions.*—The hilly areas of the State are rich in forests of chir (*Pinus longifolia*), deodar (*Cedrus deodara*), Kail (*Pinus excelsa*), Spruce (*Picea morinda*), and bamboo.

16. *Plains.*—In the plains the vegetation is composed of—

(*i*) Trees : shisham (*Dalbergia sisso*), kikar (*Acacia arabica*), ber (*Zizyphus jijuba*), phulahi (*Acacia modesta*), mulberry (*Morus alba*), nim (*Melia indica*), date-palm (*Phoenix sylvestris*), dhak (*Butea frondosa*), jamun (*Eugenia jambolina*), imli (*Tamarindus indicus*), karir (*Capparis aphylla*), pharwan (*Tamarix articulata*), pipal (*Ficus religiosa*), wan (*Salvadora oleoides*), jhand (*Prosopis spicigera*).

(*ii*) *Grasses and weeds* : Dub grass (*Cynodon dactylon*), sarkanda (*Saccharum arundinaceum*), kahi or kans (*Saccharum spontaneum*); baru (*Sorghum halepense*), malha (*Zizyphus nummuleria*), pohli (*Carthamus oxyacantha*), maini (*Medicago denticulata*), bathu (*Chenopodium album*), kasni (*Cichorium intybus*), satyaneshi (*Argemone mexicana*).

17. The principal food crops of the Punjab are wheat, gram, bajra, maize, rice, jowar and barley. Of the cash crops, the most important are cotton, oilseeds and sugarcane.

18. The State is the second largest wheat and gram producing region in the Indian Union, third in respect of barley and maize, and fourth in bajra and sugarcane. The State has been able to wipe off the food shortages of the post-partition period, and has even achieved a position of surplus production in major crops. The total production of cereals during 1956-57 was of the order of 3.5 million tons, gram 2.0 million tons, and cotton 8.0 lakh bales. The average yield of wheat, rice, barley, maize and bajra was about 10, 13, 10, 11 and 4 mds., respectively. The average yields of principal crops grown in the different districts of the Punjab are given in Appendix D.

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SECTION B

(Description of blocks and measures for reclamation)

Land utilisation

19. According to the land utilisation statistics for the year 1957-58, the State of Punjab has an area of 30 million acres classified as under :—

	Acres (millions)
(*i*) Forests	0·93
(*ii*) Land not available for cultivation—	
(*a*) Barren and unculturable land	6·52
(*b*) Land put to non-agricultural use	1·25
(*iii*) Other uncultivated land excluding fallows	
(*a*) Culturable waste	1·80
(*b*) Permanent pastures and other grazing lands	0·23
(*c*) Land under miscellaneous tree crops and groves	0·02
(*iv*) Current fallows	1·45
(*v*) Fallows other than current fallows	0·01
(*vi*) Net area sown	18·07
TOTAL	30·28

20. It will be observed that the area classified as "other uncultivated land excluding fallows" is 2.05 million acres, while the area classified as "fallows other than current fallows" is very small, being only about 11,000 acres. The district-wise distribution of the area under each of the above heads is indicated in Appendix E.

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21. Of the total area of 2.06 million acres under the heads "other uncultivated lands excluding fallow lands" and "fallows other than current fallows", the Government of Punjab originally offered about 1.5 lakh acres for reclamation. Before we visited the representative areas offered for reclamation, we had a general discussion with the officers of the State Government, who pointed out that the data supplied by the State Government was based on the revenue records and that these figures could not be considered very reliable. In particular, the information on the size of blocks was not considered quite accurate. It was, therefore, decided that a team of officers of the Punjab Government should carry out a rapid reconnaisance survey with a view to obtaining certain essential information such as the size of the blocks, the type of soil, etc. Accordingly, the survey was organised and carried out during the months of December, 1959, and January, 1960. As a result of the survey, an area of 3.04 lakh acres was located in the State for reclamation in blocks of 250 acres or more.

22. When we enquired about the reasons for the remaining areas not being available for reclamation, it was stated that the figures under the heads referred to in para 19 could not be relied upon and that the lands were in

scattered pieces and lying waste due to a variety of causes, such as unallotted evacuee property, water-logging, heavy growth of jungle, salinity, alkalinity, etc.

23. In this connection, it is pertinent to point out that, although the Committee is mainly concerned with the location of large-sized blocks of wastelands in each State, the reclamation of wastelands of less than 250 acres in size should also receive due consideration at the hands of the State Governments, since the bulk of wastelands seems to be available in smaller-sized blocks. For this purpose, it is necessary to undertake the survey as suggested in the introductory chapter.

Availability of wastelands

24. Broadly speaking, the wastelands offered for reclamation in the Punjab can be divided into the following five categories :—

I — Lands infested with thick growth of jungle, bushes and shrubs,
II — Lands lying along the banks of the rivers, and infested with pernicious grasses,
III — Saline and alkaline lands with low or high water-table,
IV — Eroded lands, and
V — Sand dunes.

25. The distribution of wastelands under categories I, II, and III above in the different districts is given below :—

District	Area available under category			Total (acres)
	I	II	III	
Karnal	15,000	—	—	15,000
Hissar	25,000	—	15,000	40,000
Patiala	1,500	—	—	1,500
Rohtak	350	—	10,000	10,350
Amritsar	—	24,500	50,000	74,500
Jullundur	—	11,000	5,000	16,000
Kapurthala	—	30,000	35,000	65,000
Ludhiana	—	11,000	8,000	19,000
Ferozepore	—	17,000	30,000	47,000
Gurdaspur	—	6.300	5,000	11,300
Gurgaon	—	—	5,000	5,000
TOTAL ..	41,850	99,800	163,000	304,650

26. Similar information in respect of wastelands in categories IV and V was not furnished to the Committee, but it was reported that about 20 lakh acres in category IV and 4 lakh acres in category V were likely to be available for reclamation. The wastelands in category IV are mainly found in the districts of Gurdaspur, Hoshiarpur, Ambala, Gurgaon and Kangra, while those in category V are located in the districts of Hissar, Mohindergarh, Gurgaon, Ferozepore and Bhatinda. A map showing the location of blocks of wastelands in different categories is appended (Map II).

CATEGORY I

Details of blocks under different categories

27. Six blocks comprising a total area of 41,850 acres have been located for reclamation in the districts of Karnal, Hissar, Patiala and Rohtak as per details below :—

District	Name of Block	Block Number	Area (acres)
Karnal	Guhla	1	15,000
Hissar	Ottu	2	15,000
	Fatehabad	3	5,000
	Tohana	4	5,000
Patiala	Harchandpura	5	1,500
Rohtak	Gujjar Kheri	6	350

28. A few comments in respect of each block are given below, while fuller details are tabulated in Appendix F.

29. *Block* 1.—This block has an area of 15,000 acres and is located in about 30 villages of Guhla sub-Tehsil, in the Karnal district. The entire area appears to have been under cultivation some years ago, but is now waterlogged due to lack of proper drainage. In recent years, a deep channel has been dug in a length of 35 miles of the course of the Saraswati, a natural stream, which has provided effective drainage for the entire area. The block is infested with thick jungles of *wan, dhak, jand,* etc. The soil is alluvium, ranging from loam to clay loam with patches of saline land here and there. Irrigation is at present seasonal, but will be perennial after the completion of the Bhakra Canal system.

30. Of 20,000 acres comprising this block, 5,000 acres have been cleared of jungle growth under the Punjab Land Reclamation Scheme, and are growing good crops of paddy. The remaining area of 15,000 acres is still to be reclaimed.

31. *Block* 2.—This block comprising 15,000 acres lies along the river Ghaggar on the Sarsa-Ottu road in the Hissar district and along the Ghaggar canals taken from the Ottu weir up to the Rajasthan border. The land is infested with thick jungle growth of *wan, jand, karir,* etc. The soil is fine silty loam in texture, but is poor in organic matter. It is, however, free from salinity or alkalinity. Seasonal irrigation is available from the canals taken from the Ottu weir. The means of communication are not very satisfactory.

32. *Block* 3.—This block consists of about 5,000 acres and is situated along the Fatehabad-Ratia road in the Hissar district. The land is infested with thick jungle growths. The texture of the soil varies from loam to clay loam, and at places where the land is subject to floods, the soil is heavy in texture. Saline and alkaline patches exist here and there. The area is commanded by the Bhakra Canal system.

33. *Block* 4.—The block measuring about 5,000 acres is situated in the Hissar Tehsil, and forms part of the Tohana C.D. Block which is connected by a good road. The soil is of the same type as in block 3, and the land is infested with jungle.

34. *Block* 5 comprises about 1,500 acres and is located near village Harchandpura in the Sammana Sub-Tehsil of the Patiala district. It lies along the banks of the river Ghaggar and is subject to floods during summer. Jungle growths round about this block have already been cleared under the Land Reclamation Scheme of the Punjab Government. This small area of 1,500 acres could not be cleared because it was under floods when the neighbouring areas were being reclaimed. The jungle growth consists of *wan, dhak, karir,* etc. The soil is fine silty loam in texture and is practically free from salinity or alkalinity. Irrigation facilities are available in the area through wells and canals.

35. *Block* 6.—This block has about 350 acres and is situated in village Kheri Gujjar, Tehsil Sonepat, in the Rohtak district, near a low-lying old natural drain which is flooded during the rainy season. The land is infested with trees like *wan, dhak,* etc., and with shrubs and bushes. At present, it is utilised for grazing cattle and also serves as village forest. The texture of the soil is loam. No irrigation facilities are available in the area.

Nature and cost of reclamation measures

36. In category I the blocks offered for reclamation have great potentiality for food production as the lands in these blocks are productive and irrigation is available in most of the areas. The land will have to be reclaimed by means of tractors. The different steps in the process of reclamation are enumerated below :—

(*i*) *Jungle clearance.*—This operation is done in two stages, *i.e.*, clearance and windrowing.

(*ii*) *Ploughing* is done to a depth of 6 inches and this is considered sufficient for destroying weeds.

(*iii*) *Planking.*—In this operation, a plank is drawn over the ploughed fields and heavy clods are pressed and levelled. To some extent, the soil is pulverised and compacted.

(*iv*) *Harrowing* is done across the ploughed furrows. The clods are completely broken up, and the soil is pulverised, forming a fine seed bed.

37. In certain areas, levelling of the cleared land is done before ploughing, planking and harrowing operations are undertaken.

38. In the Karnal district, reclamation of the marshy land is being done by a private firm under contract with the Punjab Government. The contract rate for this work during 1959-60 was Rs. 115 per acre. An additional charge was made whenever a cultivator wanted his land to be levelled. The contract rates for the different operations are as under :—

	Rs. (per acre)
(*a*) Uprooting of trees and bushes to a depth of 1½ ft. below the ground-level, including stacking	65
(*b*) Ploughing to a depth of 6"	33
(*c*) Discing to a depth of 6"	17

(d) Levelling with tractors of—	Rs. (per hour)
(*i*) 101—200 H.P.	75
(*ii*) 50—100 H.P.	50
(*iii*) less than 50 H.P.	35

39. Taking into account the rising costs of machinery, spare parts, fuel, ubricants and wages, the cost of reclamation per acre for these areas is not likely to be less than Rs. 125 per acre during the Third Plan period. Since certain lands may require levelling also, an average figure of Rs. 140 per acre may be taken as the cost of reclamation for the purpose of working out the estimates. The total cost of reclaiming 41,850 acres in category I would be Rs. 58.59 lakhs.

40. In addition to jungle clearance, patches of land which have been affected by salinity or alkalinity, will have to be treated with suitable soil amendments, and by adopting proper manurial, cultural and other soil management practices, as discussed separately in the report.

41. The question of undertaking reclamation operations by a Government-owned tractor organisation *vis-a-vis* private firms was discussed with the officials of the Punjab Government, and their view was that the present system of getting the work done through contractors was quite satisfactory and should be continued as it allowed a full play of competition and the charges were not unreasonable. We were, however, given to understand that the tenders for contracts were called annually which invariably meant delays of three to four months each year in inviting tenders, fixing rates, etc. In our opinion, contracts for longer periods would enable private firms to plan their work more efficiently and would also result in greater output at lower costs.

CATEGORY II

42. In this category, 20 blocks comprising a total area of 99,800 acres have been located in the districts of Amritsar, Jullundur, Kapurthala, Ludhiana, Ferozepore and Gurdaspur, as per details given below :—

District	Name of Block	Block No.	Area (acres)
Amritsar	Patti	7	7,000
	Verowal	8	2,500
	Ajnala	9	15,000
Jullundur	Sangowal	10	3,000
	Talwan	11	3,000
	Rahon	12	3,000
Kapurthala	Kapurthala	13	10,000
	Sultanpur	14	11,000
	Bholath	15	7,000
	Phagwara	16	2,000
Ludhiana	Machhiwara	17	5,000
	Sidhwan Bet	18	6,000

contd.

District	Name of Block	Block No.	Area (acres)
Ferozepore	Ferozepore	19	6,000
	Jalalanbad	20	5,000
	Dharamkot	21	4,000
	Mallanwala	22	2,000
Gurdaspur	Dera Baba Nanak	23	800
	Talibpur	24	1,500
	Naushera	25	2,000
	Sri Hargobindpur	26	2,000

43. A general feature of these areas, which are locally known as *mund* or *bet,* is that they are mostly situated along the river banks and drain into natural streams which run parallel to the rivers for considerable distance and ultimately join the rivers. For example, Kirn or Sakki nallah runs parallel to the Ravi in the districts of Amritsar and Gurdaspur. A perennial stream known as Byne runs along the Beas in the districts of Hoshiarpur and Kapurthala. Similarly, a stream called Budha nallah runs along the river Sutlej through the districts of Ludhiana and Ferozepore. The main problem in these areas is that the nallahs are silted up and do not function satisfactorily as natural drains, with the result that most of the areas remain flooded and water-logged during the rainy season. The areas are generally covered with thick grass growth of *kahi, sarkanda,* etc., and can be cleared only with tractors. No irrigation facilities exist in most of the blocks.

44. Details regarding the location of each block, reclamation measures considered necessary, the cost of reclamation, etc. are discussed below, while further details are given in Appendix F.

45. *Block* 7 is situated west of village Harika-Pattan along the Sutlej. The area was flooded every year until the construction of a bund at Hari-ka-pattan (confluence of the Beas and Sutlej) two or three years ago. Although now free from floods, the land is low-lying and is infested with *jhau* grass and other weeds. The soil is sandy and well-drained, but is slightly alkaline. The sub-soil water, though not very saline, has some injurious salts in toxic amounts and a proper selection of crops for cultivation in the block will have to be made after reclamation is carried out. No irrigation facilities appear to be possible in the area and only the *rabi* crops can be raised. The reclamation of the area mainly involves weed clearance. The State Government has already taken up the work in some parts of the block through the agency of a private firm at a cost of Rs. 42 per acre.

46. *Block* 8 is located along the right bank of the Beas and forms part of the Khadur Sahib C.D. Block. A portion of the area is low-lying and is subject to floods in the rainy season. The soil is alluvium and varies from sandy to sandy loam. It is well-drained and is practically free from salinity or alkalinity. Irrigation facilities exist in a part of the Block, while in the remaining area, it can be provided by the construction of wells or tube-wells.

47. *Block* 9 is situated near village Ajnala south of the Ravi. It runs along the left bank of the river and is bounded on the south by the Sakki or Kirn nallah which flows almost parallel to the Ravi at a distance of 4-5

miles. The land is flooded during the rainy season and is becoming saline and alkaline. The following measures have been taken or are under contemplation to make these potentially fertile lands fit for raising crops :—

(*i*) An earthen bund has been constructed during the last few years along the left bank of the Ravi in its entire reach of about 80 miles, in order to provide flood protection to the area south of the bund.

(*ii*) Water-logging in this area is mainly the result of silting up of the Sakki (or Kirn) nallah which does not function satisfactorily during the rainy season. Proposals for remodelling this nallah in order to provide for effective drainage of the entire area are under investigation, but the expenditure involved is likely to be very heavy. In the meantime, steps are being taken by the State Irrigation Department for clearing the obstructions in the nallah and removing two or three prominent kinks in order to improve its flow. The estimated cost of these improvements was reported to be about Rs. 10 lakhs. In addition to these, the rail and road bridges across the nallah are being remodelled. In fact, the rail bridge has already been remodelled, and the construction of important road bridges is expected to be taken up shortly. When all these improvements are made, it is hoped that the drainage of the area will be considerably improved.

Although the State Government have offered only about 15,000 acres for reclamation in this block, the clearance of the nallah will benefit the entire area lying between the bund and the nallah. The Director, Irrigation & Power Research Institute, Amritsar, has estimated the cost of effective anti-waterlogging and drainage measures in this area at Rs. 500 per acre, but it may not be necessary to incur this expenditure if the proposed clearance of the nallah is properly carried out. The over-all cost of anti-waterlogging and drainage measures in this area will obviously depend upon the extent of the area to be taken up for reclamation as the greater the area for reclamation, the less will be the cost per acre.

(*iii*) Measures for reclaiming the saline and alkaline lands as recommended under category III will need to the undertaken in order to bring the area under cultivation.

(*iv*) The land of the block is fairly even, but is infested with *sarkanda,* the removal of which will require the use of tractors. The cost of tractorisation will be Rs. 50 per acre.

(*v*) During our discussions with the Superintending Engineer, Upper Bari Doab Canal Circle, we were informed that a proposal was being considered for providing irrigation in the block by the extension of the existing Ramdas Minor. The Deputy Commissioner, Amritsar, with whom these proposals were further discussed, did not appear to favour them on the ground that their adoption might aggravate the water-logging problem. He suggested that pumping water from shallow wells should prove more useful. The cultivators, however, were keen on gravity canal irrigation because of its low cost. If adequate drainage is provided, there may not be much danger of waterlogging due to canal irrigation.

48. *Blocks* 10, 11 & 12. These blocks lie on the right bank of the Sutlej and extend from village Rahon to Lohian. The soil is sandy to sandy loam. Reclamation work is in progress in these blocks, and 7,000 acres have been cleared and brought under cultivation at a cost of Rs. 42 per acre.

49. *Blocks* 13, 14 & 15. These blocks are situated between a perennial stream called Byne and the left bank of the Beas. The soil is loamy to clay

loam. Salt incrustation is visible at the surface and there are quite a large number of patches where no vegetation is seen. The area is subject to floods during the rainy season. An earthen bund has been constructed along the left bank of the Beas in the Kapurthala district, and this has afforded protection from floods. Like the Kirn nallah, Byne stream also requires to be cleaned and kept in a proper state of maintenance. Ameliorative measures against salinity and alkalinity are also needed. About forty tube-wells have already been sunk in the area, and irrigation facilities are thus assured.

50. *Block* 16 is situated in the Phagwara Tehsil. The soil is heavy in texture and mostly alkaline. The reclamation measures needed are weed clearance and dealkalinisation.

51. *Block* 17 is located along the Budha nallah in about 12 villages extending from Chah Lohat to Milkowal. The soil near the river is sandy loam to loam, while away from the river bank, it is loam to clay and is poorly drained. No irrigation facilities exist at present, but can be made available by construction of wells and tube-wells.

52. *Block* 18 is also situated along the Budha nallah towards the left bank of the Sutlej. The area is low-lying and is subject to floods during the rainy season. The soil is alluvium, and as in other 'bet' areas, patches of saline and alkaline lands exist here and there. With the completion of the Bhakra Canal system, the danger of floods in the Sutlej will be eliminated to a large extent. Clearing of the Budha nallah and its proper maintenance will provide effective drainage for the entire area. In addition, weed clearance and the adoption of ameliorative measures for salinity and alkalinity would be necessary. Irrigation can be provided from the Sidhwan canals.

53. *Block* 19 extends from village Jamal Singhwala to village Mamdot and is spread over an area of one to two miles in width along the left bank of the Sutlej on the Indo-Pakistan border. Soil varies from sandy loam to loam with patches of saline and alkaline lands. The area is subject to floods during the rainy season.

54. *Block* 20 is located in about four village near Jalalanbad along the left bank of the Sutlej. This block is similar in all respects to block 19.

55. *Blocks* 21 *and* 22 are located in the Zeera Tehsil of the Ferozepore district, and are similar to blocks 18, 19 and 20.

56. *Block* 23 lies between the Kirn nallah and the Ravi. It is contiguous to block 9 described above, and has similar problems of reclamation.

57. *Blocks* 24, 25 *and* 26 lie along the right bank of the river Beas in a long strip of 1 to 2 miles in width from Sausher to Sri Hargobindpur. The areas are subject to floods during the rainy season. The soil varies from sandy to sandy loam. No irrigation facilities exist in the area.

58. To sum up, the areas offered in this category generally require the following treatments in order to make them fit for cultivation :—

(*a*) Clearance of weeds
(*b*) Provision of adequate drainage,
(*c*) Removal of salinity and alkalinity, and
(*d*) Provision of irrigation facilities.

59. The total expenditure on the clearance of weeds alone will work out to Rs. 49.90 lakhs at the rate of Rs. 50 per acre. For providing adequate

drainage to the areas, the three nallahs, namely, Sakki, Byne and Budha require to be cleaned, deepened and properly maintained for which a sum of Rs. 30 lakhs may be necessary. By incurring this expenditure, it is true that large areas already under cultivation would also be benefited in addition to the areas proposed for reclamation. In view of this consideration, it may not be correct to charge the entire expenditure to the reclamation account. But, for the purpose of working out the total cost of reclamation, we have assumed the figure as such. The cost of measures for the removal of salinity and alkalinity will obviously depend upon the spread of the affected areas in the different blocks. In the absence of a soil survey, it is not possible to indicate the exact cost of reclamation on this account. But, we were given to understand that 30 per cent of the area may be affected by salinity or alkalinity, requiring an expenditure of about Rs. 300 per acre for their removal. The cost of these measures for the entire area will work out to Rs. 89.82 lakhs.

60. As regards the provision of irrigation facilities, we are of the opinion that the expenditure on this account cannot be a right charge on reclamation and that it should be treated as an item of developmental expenditure.

61. Thus, the total expenditure on reclamation of 99,800 acres in category II would work out as under :—

	Rs. (lakh)
(*a*) Clearance of weeds	49·90
(*b*) Provision of drainage	30·00
(*c*) Removal of salinity and alkalinity	89·82
TOTAL	169·72

The average cost of reclamation would be Rs. 170 per acre.

CATEGORY III

62. The distribution of wastelands in this category in different districts is as given in the statement below :—

District	Extent of areas in large blocks of alkaline/saline land	
	with low water-table	with high water-table
	acres	acres
Hissar	—	15,000
Rohtak	—	10,000
Amritsar	—	50,000
Jullundur	1,000	4,000
Kapurthala	—	35,000
Ludhiana	3,000	5,000
Ferozepore	—	30,000
Gurdaspur	—	5,000
Gurgaon	—	5,000
TOTAL	4,000	1,59,000

N.B. The above figures are approximate.

64. According to the survey conducted by the Director, Irrigation & Power research Institute, Amritsar, the total area affected by salinity, alkalinity, or both in the Punjab is about 3 million acres. It is, however, not known how much of this area is lying waste and is available in fairly large blocks. Further, according to this survey, 15,000 to 20,000 acres of fertile land are going out of cultivation every year on account of salinity, alkalinity and waterlogging. This indicates the magnitude of the problem of *kalar* or *usar* lands and the necessity for taking suitable measures.

65. Experiments on the reclamation of saline and alkaline lands have been conducted by the Irrigation and Power Research Institute, Punjab, and by the Punjab Agriculture Department at the Nilokheri Farm, in the Karnal district, with high water-table, and at the Kamma Farm, in the Ludhiana district, with low water-table. Further research on the reclamation of such lands is in progress. The following methods of reclamation can be recommended for general adoption by the cultivators :—

(*i*) Where the water-table is within 5 feet, steps should be taken to drain out the excess water.

(*ii*) As a first step in the reclamation of affected lands, strong bunds about 2 ft. in height should be constructed all round the fields.

(*iii*) If pH of the soil is about 10, four tons of gypsum or press-mud should be ploughed well into the affected land. (This quantity can be varied according to the nature of the soil).

(*iv*) The field should then be heavily irrigated so as to allow gypsum to react with the soil and leach down the salts.

(*v*) When the field is in *watar* (*i.e.*, in optimum condition of soil moisture), *dhaincha* (*Sesbania aculeata*) seed should be sown broadcast in the second week of March at the rate of 20 to 30 lbs. per acre. The seed should be soaked in water for 4—6 hours before sowing so as to promote quick germination. About 2 to 3 maunds of sulphate of ammonia and an equal quantity of super-phosphate should be applied before sowing. Frequent light irrigations should be given so as to avoid injury to small seedlings.

(*vi*) When *dhaincha* plants are 8—10 weeks old, they should be ploughed into the field as green manure.

(*vii*) About 1-2 weeks after green manuring, paddy should be transplanted in the field. Sulphate of ammonia should be applied at the rate of 3 maunds per acre at the time of transplanting.

(*viii*) After paddy is harvested, a crop of *senji,* barley or berseem (as forage crop) should be grown in the field.

(*ix*) Where paddy cannot be grown, *dhaincha* should be sown in the rains and ploughed in as green manure in early September. Thereafter, barley should be sown.

(*x*) The above process should be repeated the next year but without the addition of gypsum or press-mud to the field.

(*xi*) The soil should be analysed at the commencement of the reclamation and again after two years in order to find out the effect of the above treatment.

66. The application of farmyard manure to these degraded lands helps to restore their productivity. Equally good results have been obtained with fertilizers, the application of which is also economical. Crops like sugarbeet can be grown with advantage on these lands. A suitable cropping pattern for these lands is *dhaincha* (as a green manure crop) followed by rice, barley or wheat (or sugarbeet or berseem). The old method of flooding the land in order to leach out salts followed by the cultivation of paddy has not been found effective. After reclamation, it is not advisable to grow paddy continuously as these lands have a tendency to become waterlogged.

67. The cost of reclamation of degraded alkaline or saline lands is Rs. 250 per acre when the water-table is low. In the case of high water-table, the reclamation cost may be as high as Rs. 500 per acre because of the heavy expenditure on drainage. Considering that 50,000 acres out of the total area of 1,63,000 acres affected by *kalar* are reclaimed during the Third Plan period, the expenditure on this account will be Rs. 2.4 crores. This can be met partly from the provision of Rs. 6 crores (provisional) made for the reclamation of saline and alkaline lands by the Ministry of Food and Agriculture, and partly from the amount earmarked for drainage and anti-waterlogging measures out of the total provision of Rs. 80 crores made for flood control, drainage, anti-waterlogging and anti-sea erosion by the Ministry of Irrigation and Power.

68. We strongly recommend the setting up of pilot projects in the districts where the problem of salinity and alkalinity is acute, so as to demonstrate to the cultivators practical methods of reclaiming affected lands. It may also be necessary to make provision for the supply of *dhaincha* seeds for green manuring and fertilizers and manures to the cultivators at subsidised rates. Further, there is an imperative need for research on cheap materials for drainage, depth and spacing of tile drainage and their economics, as it is felt that in areas with high water-table, unless cheap methods of improving drainage are introduced, reclamation measures may not be adopted by the cultivators as a regular practice.

69. In the Punjab, canal irrigation has aggravated the problem of waterlogging of the soil. The evil consequence of waterlogging is the development of salinity and alkalinity in the cultivated lands, which render them unproductive in a few years. The problem of reclamation of these lands is, therefore, connected with the study of the soils from the point of view of their structure, permeability and the nature and contents of the salts in the soil profile. For these studies it is necessary that a competent soil scientist should be associated with the irrigation engineer. We were informed by the State representatives that adequate provision for soil studies had been made both by the Agriculture Department and the Department of Irrigation, and that these facilities were being further strengthened in the Third Five Year Plan. We were glad to know that the importance of conducting soil studies in connexion with the reclamation of waterlogged lands had been recognised by the State Government.

CATEGORY IV

70. Eroded wastelands are mostly found in the hilly parts of the districts of Gurdaspur, Hoshiarpur, Ambala, Kangra and Gurgaon. The soils are sandy loam to sandy in texture and are extremely poor in fertility. Owing to reckless felling and uncontrolled grazing, the susceptibility of these lands to erosion has considerably increased. For their improvement, measures such as contour bunding and terracing are essential. Since cultivation in these areas is mostly 'barani', there is need to evolve a suitable system of dry farming in order to check further deterioration of the soil. We were given to understand that the Department of Agriculture proposes to launch an intensive programme of soil conservation on the agricultural lands of this tract, but the success of this programme will mainly depend upon the pattern of financial assistance to the cultivators for carrying out improvements on their holdings.

71. We recommend that the pattern of financial assistance on the Bombay model may be adopted for sharing the expenditure on contour-bunding and the introduction of dry farming methods of cultivation. According to this pattern, 25 per cent of the expenditure on counter-bunding is treated as subsidy to be shared equally between the Centre and the State Government, and the balance is advanced as loan to the cultivator to be recovered in equal annual instalments spread over a period of 10 to 15 years. Assuming that the State Government will set up an effective organisation for undertaking soil conservation measures on eroded lands, it may be possible to cover 25,000 acres per year. The total cost of contour bunding an area of 1,25,000 acres over a period of five years will amount to Rs. 75 lakhs. This expenditure can be met from the provision of Rs. 56 crores made by the Ministry of Food and Agriculture for projects on contour-bunding of agricultural lands under the head 'Soil Conservation'.

CATEGORY V

72. There are large areas of wastelands under sand dunes in the arid tracts in the districts of Gurgaon, Mohindergarh, Hissar, Bhatinda and Ferozepore. Although no information regarding the actual extent of wastelands in this category in the different districts is available, it is gathered that in the Hissar District alone about 4 lakh acres are lying waste, particularly in South Hissar, Loharu, Bhawani and adjoining areas. Similarly, in the areas adjoining Rajasthan, large tracts of sand dunes re-reported to be available in the district of Bhatinda, Ferozepore, Mohindergarh and Gurgaon. The main problems of these areas are (*a*) wind erosion, (*b*) lack or irrigation facilities, (*c*) brackish sub-soil water, and (*d*) poor soil fertility.

73. For successful reclamation of these lands, it is necessary to undertake soil conservation measures, such as planting of wind-breaks, growing of suitable shrubs and grasses for stabilisation of sands, improvement of soil fertility by the introduction of suitable crops, and provision of irrigation facilities. Research on the methods of improving the quality of brackish water has also to be conducted so as to enable the utilisation of the sub-soil water. It is estimated that the reclamation of such lands will cost about Rs. 500 per acre.

SECTION C

(Disposal of reclaimed lands for cultivation)

Nature of ownership of wastelands and their disposal for cultivation

74. In this Section, we deal with the various measures needed for the disposal and development of wastelands which have been located in the State. It is obvious that the measures required for the purpose would primarily depend upon the nature of ownership of wastelands. In the State of Punjab, the wastelands are owned by the following:—

(1) Private individuals,

(2) Government (*Nazool* lands).

(3) Custodian of Evacuee Property, and

(4) Village Panchayats.

75. A statement showing the breakdown of wastelands according to their ownership in respect of categories I and II is given in Appendix G. Similar information for the remaining categories of wastelands, *i.e.*, categories III, IV and V was not furnished to the Committee. It would be observed from the statement that most of the lands in category I belong to private individuals, while those in category II are mostly either privately-owned or are under the control of the Custodian of Evacuee Property. Only a very small percentage of the wastelands belongs to the Government and the village panchayats. The problems involved in the disposal of wastelands in each category of ownership are discussed below :—

75.1. *Private lands.*—Under the existing Land Reclamation Scheme of the State Government, wastelands belonging to private individuals, are handed over, after reclamation, to the respective owners for follow-on cultivation. The reclamation charges together with the interest thereon are recovered in sixteen half-yearly instalments. We were informed that there had been no difficulty in recovering the reclamation charges and that the entire area was brought under cultivation immediately after reclamation. In view of this, the State Government feels that there is no necessity for undertaking any resettlement operations in these areas. We agree with this view.

75.2. *Government lands.*—As regards wastelands belonging to Government (*Nazool* lands), these lands are returned, after reclamation, to the Deputy Commissioners of the districts concerned for arranging follow-on cultivation. The instructions framed for the allotment of these lands to the backward classes may be seen in Appendix H. Allotments are made either to individuals or to the co-operative societies, and no colonisation projects are contemplated by the State Government. There appears to be some delay in the allotment of lands after reclamation on account of the complicated procedure involved. Such delays should be avoided as these often result in the loss of one year's crop.

75.3. *Custodian of Evacuee Property lands.*—Evacuee lands, after the completion of reclamation work, are returned to the Custodian of Evacuee

Property who has to arrange for their follow-on cultivation either by permanent allotment or by temporary lease. The present rules do not provide for a lease of more than one year and no allottee comes forward to cultivate these lands for such a short period. A sizeable percentage of such lands which had been reclaimed in the past few years, has remained out of cultivation for this reason. In order to ensure proper follow-on cultivation, the creation of some sort of ownership is necessary. We learn that the Punjab Government are already in correspondence with the Government of India for acquiring all evacuee lands on a permanent basis for the resettlement of landless peasants, ex-servicemen, Rai Sikhs, etc., A copy of the scheme for resettlement may be seen in Appendix I. The Committee is in agreement with the proposed scheme for the allotment of evacuee lands, but would like to make the following suggestions in this connection:—

(*a*) Clause (20) of Schedule B of the scheme stipulates that the tenant shall not use the said lands or any part thereof in a manner which renders them unfit for the purpose for which he holds them, and shall bring one-half of the cultivated area thereof under cultivation within three years from the date of commencement of the tenancy and the whole of it similarly reckoned within five years from the same date, and thereafter he shall keep the said lands under cultivation to the extent of one-half thereof during each harvest. No penalty has, however, been proposed for non-fulfilment of this clause, and this seems to be necessary.

(*b*) The conferment of the ownership rights on the tenants should be done only when the Government are satisfied that the cultivation was being carried on efficiently.

(*c*) Schedule A giving particulars of the lands which are proposed to be allotted does not seem to cover all evacuee lands now proposed for reclamation. It is necessary that the scheme should be made applicable to all the evacuee lands proposed for reclamation.

(*d*) In the case of areas located along the border of West Pakistan, the following concessions and facilities may be offered by the State Government:—

(*i*) Land reclamation charges may be borne by the State.

(*ii*) Suitable subsidy may be given for sinking wells, purchase of bullocks, fertilizer, seed and construction of houses.

75.4. *Village Panchayat lands.*—These lands, after reclamation, are given back to the village panchayats for arranging follow-on cultivation. Past experience has shown that the panchayats have invariably failed to arrange for proper follow-on cultivation with the result that the benefits of reclamation have not been realised. The Committee understands that the Punjab Government have now set up a separate Directorate for the effective management of common lands. It is hoped that this department will quickly draw up plans for resettlement and follow-on cultivation of these lands.

Suggestions for effective utilisation of wastelands.

76. Having dealt with the disposal of wastelands, we consider it necessary to make a few suggestions for their effective utilisation.

are of the view that the success in the utilisation of wastelands is achieved only if reclamation is followed by suitable follow-on cultivation operations.

77. A detailed soil survey for land-use should be carried out in each are proposed for reclamation so that the requisite information on the proper utilisation of land is available. The State Government can apply for final assistance for conducting these surveys to the Central Soil Conservation Board.

78. The agricultural staff should suggest suitable cropping patterns and also introduce improved agricultural practices in the reclaimed areas, so that the lands are put to the best use. The extension staff of the Community Development Department can play a useful part, particularly in the demonstration of improved methods of cultivation and in arranging for the supply of agricultural requisites. As most of the areas offered for reclamation are now covered by the C.D. Blocks, the Block funds should be available for the above purpose.

79. In view of the large-scale reclamation work to be undertaken in the State, we suggest that this work may be entrusted to a full-time senior officer who should be made responsible for the following:—

(*a*) preparation and execution of land reclamation schemes,

(*b*) ensuring proper follow-on cultivation operations in the reclaimed areas with a view to improving the productive capacity of the reclaimed lands,

(*c*) to augment facilities for the supply of irrigation water to the reclaimed areas, to arrange for loans for the purchase of pumping sets, construction of wells, tube-wells, etc. in the reclaimed areas, and

(*d*) to help in the allotment of wastelands to individuals and co-operative societies.

80. Since practically no irrigation facilities exist in the *bet* areas, construction of shallow wells may be encouraged by the grant of subsidy and loans on a liberal scale to the cultivators.

81. The *bet* lands are very fertile, but they are infested with pernicious weeds and grasses which are difficult to eradicate unless facilities for mechanical cultivation are made available to the cultivators. Ordinarily it would not be within the reach of a cultivator to own a tractor, and we would, therefore, recommend that the State Government should set up tractor stations to be managed by private tractor companies. The tractor stations should be located at strategic places in *bet* areas, so that cultivators may not experience much difficulty in hiring tractors and tractor-implements for ploughing, harrowing and other farm operations. The most important benefit of the tractor stations would be that quick, efficient and timely follow-on cultivation operations, which have a very beneficial effect on crop yields, would be ensured. We also suggest that the cultivators should be encouraged to purchase tractors by the grant of loans recoverable in easy instalments.

82. *Bet* lands are inundated by river floods which are an annual feature of the riverain areas. In order to protect these lands from flood hazards and to prevent the erosion and under-cutting of the river banks, it is

suggested that a belt of thick growth of trees and grasses, about 1,000 ft. in width, should be established along the river banks.

83. The general crop patterns of the lands in the different categories are as under:—

83.1. *Category I.*—The blocks selected for reclamation in this category are situated in the districts of Karnal, Hissar, Patiala and Rohtak. On irrigated lands, double cropping is practised in these districts. Suitable crop rotations are in vogue, which also include the cultivation of forage crops like berseem, *senji*, etc. The principal *kharif* crops are paddy, maize, cotton, pulses and fodder jowar, and the important crops grown in the *rabi* season are wheat and gram. In the Karnal district, paddy is extensively grown, while sugarcane is an important cash crop in the districts of Rohtak and Karnal.

83.2. Single cropping is the general rule in *barani* cultivation. If the soil is good, wheat or a mixture of wheat and gram is sown. Gram is generally grown on light sandy soils. Mustard is sown mixed with wheat or gram.

83.3. *Category II.*—The bet lands are found in the riverain tracts of Amritsar, Jullundur, Kapurthala, Ferozepore and Gurdaspur. Surgarcane is an important crop of this tract, and there are great possibilities of extension of cultivation of this crop. Where the water-table is not high, both *kharif* and *rabi* crops grow well. Among the oilseeds, sesamum is extensively cultivated in the Amritsar and Gurdaspur districts, either as a pure crop or mixed with other crops.

83.4. *Category III.*—A cropping pattern for saline and alkaline lands, as recommended by the Punjab Agriculture Department, is *dhaincha* (as a green manure crop) followed by rice, barley or wheat (or sugarbeet or berseem). After reclamation, it is not advisable to grow paddy continuously on these lands as they are prone to become waterlogged.

83.5. *Category IV.*—In the hilly areas of the sub-mountane tract, wheat and maize are extensively cultivated. Rice, mustard and lentils are also grown. Barley is the principal *rabi* crop in the Gurgaon district.

83.6. *Category V.*—Sand dunes or arid tracts are more suitable for pastures. *Bajra* is the principal millet of this area. *Taramira* is grown in Hissar, Ferozepore, and Mohindergarh. *Mung* is grown as a mixture with *bajra* in the Hissar district. *Moth* is cultivated in the Ferozepore and Hissar districts.

Economic aspects of reclamation

84. We shall now examine the economic aspects of reclamation in terms of the addition to food production with reference to the expenditure involved. At present, no reliable figures of additional yields of crops grown in the areas where land reclamation work has already been done, are available. We, therefore, recommend that crop-cutting surveys should be conducted in the reclaimed areas during the Third Five Year Plan in order to have an accurate idea of the additional food production due to the land improvement measures. Our visits to some of the reclaimed areas where crops had been grown, have, however, given us a fairly good

idea of the potentialities of the areas proposed for reclamation in categories I and II, and we feel that, on a conservative estimate, the figures of annual additional food production per acre (if other crops are grown, their equivalents in terms of food crops) may be assumed as under:—

Category I	..	20 mds
Category II	..	10 mds

85. In this connection, it may be noted that most of the areas in category I have perennial irrigation and are capable of producing two crops in the year. In category II, the lands are fertile, but a large proportion of them has no assured irrigation supply and only seasonal crops can be grown.

86. As regards the lands in category III, results of experiments have shown that these lands can be made productive after the first two years of the treatment described in para 65. An estimated yield of 20 maunds of paddy per acre has been obtained in the reclaimed lands. For the purpose of calculations, we have assumed the figure of 15 maunds per acre.

87. The eroded wastelands in category IV are found in the hilly areas of Kangra, Gurdaspur, Hoshiarpur and Ambala, which receive a rainfall of 40" to 70". The average yield of wheat in these districts ranges from 586 lb. to 716 lb., and that of maize from 592 lb. to 1,205 lb. per acre (*vide* Appendix D). Although these lands are poor in fertility, a well-planned programme of soil and water conservation will rehabilitate them in a few years. For our present purpose, we may assume a yield of 5 maunds per acre as a result of soil conservation measures.

88. The lands in category V are located in tracts of low and variable rainfall. Results of experiments conducted in the past have shown that the adoption of a suitable dry farming system of cultivation increases the yield of *bajra,* which is the principal crop of the arid tracts, by one to two maunds per acre.

89. In order to assess the relative economic benefits of reclamation between the different categories of reclaimable lands, it is necessary that the figures of estimated additional food production should be studied in relation to the costs of reclamation as worked out in the previous section. Table I gives the area proposed for reclamation in each category, the cost of reclamation, the additional food production, and the cost of reclamation per maund of additional food production.

TABLE I

Cost of reclamation of land in different categories and estimated additional production

Category	Description	Area proposed for reclamation (acres)	Average cost of reclamation per acre (Rs.)	Total cost of reclamation (Rs. lakhs)	Additional production per acre (maunds)	Total additional production (maunds)	*Value of total additional production (Rs. lakhs)	Value of additional production acre (Rs.)	Average cost of reclamation per maund of additional production (Rs.)
I	Lands over-grown with jungle and shrubs	41,850	140	58·59	20	8,37,000	100·44	240	7
II	*Bet* or riverine lands	99,800	170	169·72	10	9,98,000	119·76	120	17
III	Saline and alkaline lands	4,000	250	10·00	15	7,50,000	90·00	180	17
		(a)	(a)	(a)					(a)
		46,000	500	230·00					33
		(b)	(b)	(b)					(b)
IV	Eroded lands	1,25,000	60	75·00	5	6,25,000	75·00	60	12
V	Sand dunes or arid tracts	—	500	—	2	—	—	12	250
	TOTAL ..	3,16,650		543·31		32,10,000	385·20		

'a' for areas with low water-table.

'b' for areas with high water-table.

* (*i*) The main food crops of the areas included in categories I to IV are wheat, paddy, maize and gram. A common price of Rs. 12 per maund is assumed.

(*ii*) The crop of the areas in category V is *bajra*, for which the price of Rs. 6 per maund is taken.

90. It will be seen from the table that the cost of reclaiming 3,16,650 acres of land in categories I to IV cores to about Rs. 5.43 crores, *i.e.*, about Rs. 171 per acre. The estimated additional production from the reclaimed land is 32,10,000 maunds (1,17,500 tons), valued at about Rs. 3.85 crores, In terms of additional production, therefore, the average cost of reclamation per acre is economic, since the total expenditure involved can be recovered in two crop seasons.

91. As regards the cost of reclamation of lands in the different categories, category IV offers the greatest promise for increasing agricultural production since the cost of land improvement is the lowest, and there are also large areas of eroded lands where contour-bunding combined with dry farming methods of cultivation can produce quick and beneficial results for the needy sections of the farming community. In spite of these advantages, we have recommended that contour-bunding operations may be undertaken in only 1,25,000 acres out of about 2 million acres of eroded lands, because the State Department of Agriculture has at present no staff specially trained for undertaking this work on agricultural lands, and it will take some time before a really effective organisation for soil conservation can be built up in the State. In terms of the additional production per acre, however, the lands in category I seem to be the most promising, followed by the lands in categories III and II. The lands in category I can produce, on an average, 20 maunds of foodgrains, and, as these lands can give economic returns to pay off the cost of reclamation even in one crop season, they should receive a very high priority in the reclamation programme of the State. As regards category V, we consider that our present financial resources will not permit us to make large investments on lands which are situated in tracts of precarious rainfall, and where the returns are not expected to be commensurate with the heavy expenditure involved.

92. The benefits of reclamation should not be measured mainly in terms of additional food production, but should be viewed from the social angle as well. The conversion of jungle lands which are normally the abode of dacoits and anti-social elements, into prosperous farms and settlements solves the problem of law and order in these areas and also helps in the rehabilitation of the poorer sections of the communty, like the landless labourers, scheduled castes and tribes, backward classes, refugees, etc. Another benefit of reclamation is the utilisation of irrigation water to a greater extent. Further, new areas are opened up and new avenues of employment are made available to the community. In many places, roads are constructed in order to meet the needs of the growing population and for the transport of the agricultural produce to the market. These are but a few of the many lasting benefits that accrue from a well-planned programme of reclamation.

Priorities between different categories of reclaimable lands

93. We now proceed to discuss the question of assigning priorities between the different categories of reclaimable lands. The answer to this question will be found in what has already been stated in this section.

94. We recommend that the wastelands included in category I may be assigned the top-most priority. Amongst the various blocks offered for reclamation included in this category, those in the districts

of Karnal, Hissar and Patiala may be taken up first, followed by the block in the Rohtak district which has, at present, no irrigation facilities.

95. Next in the order of priority are the degraded lands in category IV. The cost of land improvement in their case is the lowest among all the categories of wastelands, and there are also vast areas which can be quickly reclaimed if a suitable organisation is set up in the State. The cost of reclamation per maund of foodgrains produced (*vide* last column of Table I) is also lower in this category than in categories II and III. We would, therefore, recommend that the rehabilitation of degraded lands should be assigned a very high priority, and that soil and water conservation measures should be undertaken on at least 1,25,000 acres over the next five years.

96. As regards category III, the extent of the area to be reclaimed during the Third Plan period has been indicated in para 67. We are, however, not in a position to indicate as to what should be the order of priorities among the different areas as this will mainly depend upon the execution of drainage and anti-waterlogging schemes and the priorities assigned to them by the State Government in the Third Plan. At the same time we suggest that the State Government may conduct a rapid survey of the areas affected by salinity and alkalinity, and select only such areas for reclamation as have low water-table, or where reclamation can be carried out in large-sized blocks at a comparatively less cost.

86. 1. As regards the lands with high water-table, the cost of reclamation does not seem to be within the reach of an ordinary cultivator, but if the work is organised on a co-operative basis over large areas, the cost can be considerably brought down. Considering the extent of damage caused to cultivated lands by salinity and alkalinity in the Punjab, the importance of reclamation of these lands cannot be over-emphasised. We, therefore, recommend that the reclamation of saline and alkaline lands with high water-table should receive particular attention of the State Government, although the cost of reclamation, including the cost of drainage, seems to be the highest among the categories I to IV.

97. The *bet* or riverine areas included in category II may be assigned the lowest priority in view of the fact that these lands, although fertile and capable of producing good crops under favourable conditions, are subject to flood hazards, which make cultivation in these areas rather precarious. However, if the recommendations made by us in paras 80, 81 and 82 are adopted, these lands may prove to be an important source of agricultural production. As regards priorities within this category, it is difficult to make any suggestions as the choice of the areas for reclamation in this category will primarily depend upon the drainage and irrigation schemes that may be taken up during the Third Plan period.

98. The question of reclamation of sand-dunes (category V) should be taken up only when irrigation is available in the areas. The cost of reclamation is quite heavy and the returns are not commensurate with the expenditure involved. These lands are more suited for the development of pastures, and until irrigation is available, they should not be utilised for arable cultivation, except the flat areas where dry farming can be practised

1. The total extent of wastelands in the Punjab, according to the land utilisation statistics of 1957-58, is 2.06 million acres classified as "other uncultivated lands excluding fallows" (2.05 million acres), and "fallows other than current fallows" (0.01 million acres). Of this area of 2.06 million acres, 3.04 lakh acres have been located in the State for reclamation in blocks of the sizes of 250 acres or more.

(Paragraph 20)

2. The wastelands found in the State may be classified into the following five categories :—

I—Lands infested with thick growth of jungle, bushes and shrubs,

II—Lands lying along the banks of the rivers, and infested with pernicious weeds and grasses,

III—Saline and alkaline lands,

IV—Eroded lands, and

V—Sand dunes or arid tracts.

(Paragraph 24)

3. The distribution of wastelands in categories I to III is as under :—

Category	*Area* (acres)
I	41,850
II	99,800
III	1,63,000

In addition, 2 million acres in category IV and 4 lakh acres in category V are reported to be available for reclamation, but their distribution in large-sized blocks is not known.

(Paragraphs 25 and 26)

4. The blocks offered for reclamation in category I have great potentiality for food production as the lands in these blocks are fertile and irrigation is available in most of the areas. The cost of reclamation is estimated at Rs. 140 per acre. The total cost of reclaiming 41,850 acres would be Rs. 58. 59 lakhs.

(Paragraphs 36 and 39)

5. The system of getting the jungle clearance work done through contractors has proved quite satisfactory and should be continued. However, the practice of awarding contracts on an annual basis has resulted in delays in the execution of work. It is suggested that contracts should be given for longer periods than one year, so as to enable the contracting companies to plan their work more efficiently. This procedure will result in greater output at lower costs.

(Paragraph 41)

6. The areas in category II are mostly situated along the river banks. The main problem of these areas is that the nallahs are silted up and do

alkaline. The areas are covered with thick grass growth and can be cleared only with tractors. Practically no irrigation facilities exist in most of the blocks.

(Paragraph 43)

7. The total expenditure on the reclamation of 99,800 acres in category II works out as under :—

	Rs. (lakhs)
(*a*) Clearance of weeds	49·90
(*b*) Provision of drainage	30·00
(*c*) Removal of salinity and alkalinity	89·82
TOTAL	169·72

The average cost of reclamation would be Rs. 170 per acre.

(Paragraph 61)

8. The total area of saline and alkaline lands available in large-sized blocks is 1,63,000 acres. The cost of reclamation of these lands is Rs. 250 per acre when the water-table is low, and Rs. 500 when the water-table is high. It is suggested that at least 50,000 acres of affected land may be taken up for reclamation during the Third Five Year Plan period. The total cost of reclamation will be Rs. 2.4 crores.

(Paragraphs 62 and 67)

9. The methods of reclamation of the lands affected by salinity and alkalinity have been investigated by the Punjab Agriculture and Irrigation Departments, and suitable recommendations have been made. Pilot projects should be set up in the districts where the problem of salinity and alkalinity is acute, with a view to demonstrating to the cultivators the practical methods of reclaiming the affected lands. Provision should also be made for the supply of *dhaincha* seeds to the cultivators at subsidised rates.

(Paragraphs 65 and 68)

10. In the reclamation of lands affected by salinity and alkalinity, it is essential that the physical and chemical properties of the affected lands should be studied with a view to devising suitable methods of reclamation. It is, therefore, necessary that a competent soil scientist should be associated with the irrigation engineer. We were glad to note that the State Government was fully aware of the importance of soil investigation in connection with the reclamation of waterlogged lands.

(Paragraph 69)

11. Eroded wastelands are mostly found in the hilly tracts of the districts of Gurdaspur, Hoshiarpur, Ambala, Kangra and Gurgaon. For their improvement measures such as contour-bunding and terracing are essential. There is need to evolve a suitable dry farming system of cultivation in order to check further deterioration of these lands. It is recommended that soil and water conservation measures may be undertaken on at least 1,25,000 acres over a period of five years. The cost of these measures will be Rs. 75 lakhs. Of the expenditure on contour-bunding, 25 per cent may be given as subsidy to the cultivators, and the

balance treated as loan to be recovered in equal annual instalments spread over a period of 10 to 15 years.

(Paragraphs 70 and 71)

12. The wastelands in the State are owned either by private individuals, the Government, the Custodian of Evacuee Property, or village panchayats. The lands owned by private individuals are brought under cultivation immediately after reclamation. There appears to be some delay in the allotment of Government lands after reclamation on account of the complicated procedures involved. It is suggested that such delays should be avoided as far as possible.

(Paragraphs 74, 75.1 and 75.2)

13. As regards the evacuee lands, these are returned, after reclamation, to the Custodian of Evacuee Property, who arranges for their follow-on cultivation either by permanent allotment or by temporary lease. The present rules do not provide for lease of more than one year and no cultivator comes forward to cultivate these lands for such a short period. It is suggested that the Punjab Government should allot the evacuee lands on a permanent basis for the resettlement of the landless peasants, ex-servicemen, Rai Sikhs, etc., in accordance with the scheme drawn up by the State Governments.

(Paragraph 75.3)

14. Lands belonging to the village panchayats are not allotted for follow-on cultivation immediately after reclamation. The State Government has set up a Directorate for the effective management of common lands, and it is hoped that this Directorate will quickly draw up plans for the resettlement and follow-on cultivation of these lands.

(Paragraph 75.4)

15. Detailed soil surveys for land use should be carried out in each area proposed for reclamation, so that the requisite information on the proper utilisation of land is available.

(Paragraph 77)

16. The staff of the Agriculture Department should suggest suitable cropping patterns and also introduce improved agricultural practices in the reclaimed areas so that the lands are put to the best use. The extension staff of the Community Development Department can play a useful role in the demonstration of improved methods of cultivation and in arranging for the supply of agricultural requisities.

(Paragraph 78)

17. In view of the large-scale reclamation work to be undertaken in the State, the work of land reclamation may be entrusted to a full-time senior officer who should be responsible for ensuring proper follow-on cultivation in the areas reclaimed, and for helping in the allotment of wastelands to individuals and co-operative societies.

(Paragraph 79)

18. Since practically no irrigation facilities exist in the *bet* areas, construction of shallow, open wells may be encouraged by the grant of subsidy and loans on a liberal scale to the cultivators.

(Paragraph 80)

ment should set up tractor stations to be managed by private tractor companies, so that the cultivators may be able to hire out tractors and tractor-implements for ploughing, harrowing and other farm operations. The cultivators should also be encouraged to purchase tractors by the grant of loans recoverable in easy instalments.

(Paragraph 81)

20. As *bet* lands are subject to annual floods from the rivers, we recommend that a belt of thick growth of trees and grasses, at least 1,000 ft. in width, may be established along the river banks in order to provide protection to the lands from the floods and prevent erosion and under-cutting of the banks.

(Paragraph 82)

21. Crop-cutting surveys should be conducted in the reclaimed areas during the Third Five Year Plan period, in order to have an accurate idea of the additional food production due to the land improvement measures.

(Paragraph 84)

22. The total cost of reclaiming 3,16,650 acres of land in categories I to IV comes to Rs. 5. 43 crores, i.e., about Rs. 171 per acre. The estimated additional production from the reclaimed areas is 1,17,500 tons valued at Rs. 3.85 crores. In terms of additional production, the average cost of reclamation per acre is economic.

(Paragraph 90)

23. A study of the cost of reclamation of lands in the different categories reveals that category IV offers the greatest promise for increasing agricultural production since the cost of land improvement per acre is the lowest, and there are also large areas of eroded lands where the adoption of soil and water conservation measures will produce quick and beneficial results for the needy sections of the farming community. In terms of additional production per acre, however, the lands in category I seem to be the most promising followed by the lands in categories III and II. The lands in category V are situated in tracts of low and variable rainfall and the returns are not expected to be commensurate with the investments on their improvement.

(Paragraph 91)

24. The following is the order of priority assigned to the different categories of land on the basis of the additional production per acre and the cost of reclamation :—

	Priority
Category I	1
Category IV	2
Category III	3
Category II	4

(Paragraph 94 to 98)

25. Although high priority has not been assigned to the reclamation of wastelands affected by salinity and alkalinity, it is hoped that, in view of the widespread damage to the cultivated lands caused by waterlogging, the State Government will give particular attention to the reclamation of saline and alkaline lands.

(Paragraphs 96 and 96.1)

26. The reclamation of sand dunes in the arid tracts should be taken up only when irrigation is available in these areas. The cost of reclamation is quite heavy, and the returns are not commensurate with the expenditure on land improvement.

(Paragraph 98)

Sd.—
(B. N. UPPAL)
Chairman.

Members .. ..

Sd.—
1. (F. C. GERA)
Sd.—
2. (J. P. MITAL)
Sd.—
3. (M. S. V. RAMA RAO)

Co-opted members from the Punjab State

Sd.—
1. (LAL SINGH)
Additional Secretary,
Revenue Department.
Sd.—
2. (S. C. JAIN)
Deputy Secretary to Government,
Punjab, Development (P) Department.
Sd.—
3. (S. K. MISRA)
Deputy Secretary,
Agriculture Department.
Sd.—
4. (H. L. UPPAL),
Director, Irrigation and Power
Research Institute.
Sd.—
5. (P. S. SAGGOO),
Officer on Special Duty,
Project Circle, Irrigation Branch.

Sd.—
(A. S. VENU GOPALAN),
Secretary.

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सत्यमेव जयते

NO. F. 1024/SPL/59
GOVERNMENT OF INDIA
MINISTRY OF FOOD & AGRICULTURE
(*Department of Agriculture*)

New Delhi, June 11, 1959.

My dear

You will agree that the importance of reclamation of culturable wastelands for the purpose of increased agricultural production cannot be overemphasised. The extent of culturable wastelands in the country has been variously estimated and the figures run into millions of acres. These wastelands are of two categories :—

(a) lands which are really adjuncts of village *abadis* and are meant to serve as pastures and fuel forests or sites for the extension of the *abadis* ; and

(b) large blocks of land which have either gone out of cultivation or have never been brought under cultivation

It is the latter category which affords the greatest promise for increased agricultural production. The site of large areas of uncultivated land has yet to be determined. Government, therefore, have decided to appoint a Committee of experts which will work in collaboration with experts in the States in regard to which the Committee will make the investigations.

2. The following will be the terms of reference of the Committee :—

(1) to make a survey of land classified as "other uncultivated land excluding fallow lands" and "fallow lands other than current fallows" and locate areas where large blocks of land are available for reclamation and resettlement;

(2) to suggest suitable measures for reclamation according to conditions in different areas and estimate the cost of reclamation and colonisation and the financial assistance and agricultural extension and training necessary for the settlers (the settlements being made on a co-operative basis);

(3) to suggest the terms and conditions upon which settlement should be made, the areas to be allotted and the payments to be made by settlers' co-operatives; and

(4) to estimate the economic aspects of such reclamation in terms of the expenditure involved, the likely addition to food production and the employment and income that would become available to settlers and their families and to lay down the priorities *inter se* between different categories of reclaimable lands.

	ment of India	Chairman
2.	*Dr. J. K. Basu, Senior Director of Soil Conservation Government of India	Member
3.	Shri F. C. Gera, Chairman, Central Tractor Organisation	Member
4.	Shri J. P. Mital, Irrigation Adviser, Ministry of Community Development and Co-operation	Member

In addition, the Committee will co-opt in individual States the following officers :—

1. The Development Commissioner;
2. The Revenue Secretary;
3. The Secretary of the Agriculture/Forest Department, or his nominee; and
4. A representative of the Irrigation Department.

4. During the course of the next two or three months, the Committee will take up preliminary work for collection of data with the help of the State Governments and will then visit individual States from the beginning of September, 1959. The intention is that the Committee should complete its work and submit its proposals in respect of one State in about a month and then proceed to take up the investigation in another State. In order to ensure effective coordination and speedy completion of the work, it is suggested that each State Government/Union Territory may kindly appoint a fairly Senior officer who would be able to devote sufficient time to the work of the Committee, help it in collecting the necessary information and carry on correspondence with it. The name and designation of the officer may kindly be communicated to Dr. B. N. Uppal, Chairman of the Committee.

5. In view of the urgent need for bringing wastelands, wherever available, under cultivation and thus increasing agricultural production, it is hoped that the State Governments would kindly extend their full cooperation and provide the necessary facilities for the work of this Committee.

Yours sincerely,

(Sd.) K. R. Damle

Chief Secretaries,
All States and Union Territories.

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*On retirement of Dr. J. K. Basu, Shri M. S. V. Rama Rao, Senior Director of Soil Conservation, Govt. of India, was appointed a Member from the 3rd Feb., 1960 *vide* Memo. No. 12-1/59-GMF(Co), dated the 3rd February, 1960 (copy enclosed).

GOVERNMENT OF INDIA
MINISTRY OF FOOD & AGRICULTURE
(*Department of Agriculture*)

New Delhi, the 3rd February, 1960.

SUBJECT :—*Reclamation of culturable wastelands in the country—Setting up of a Committee.*

Reference this Ministry's Express letter of even number dated the 17th June, 1959, on the subject mentioned above. The following amendment may please be made in regard to the Membership of the Committee as mentioned in D.O. No. F. 1024/SPL/59, dated the 11th June, 1959, referred to therein :—

"Shri M. S. V. Rama Rao,
Senior Director of Soil Conservation,
Government of India,

in place of Dr. J. K. Basu since retired".

(Sd.) V. Balasubramanian.
Under Secretary.

सत्यमेव जयते

(Culturable wasteland is defined as under :—

All lands available for cultivation, whether not taken up for cultivation or abandoned after a few years for one reason or the other. Such lands may be either fallow or covered with shrubs and jungles and which are not put to any use. They may be assessed or unassessed or may be in isolated blocks or within cultivated holdings. Land once cultivated but not cultivated for five years in succession is included in this category).

2. What is the area under permanent pastures and other grazing lands?

3. What is the extent of land under miscellaneous trees and groves?

4. What is the extent of fallow lands other than current fallows?

(Current fallows are defined as those lands which remain fallow for the current year only.

Lands other than current fallows are defined as lands which are fallow for more than one year but less than five years).

5. Out of the areas at questions 1, 2, 3, and 4 above, is it possible to demarcate blocks of 1,000 acres or more for purposes of colonization and resettlement? If so, how many such blocks?

6. How many blocks could be carved out if the size of the block is reduced from 1,000 acres and more to 500 acres and more? So far as blocks of 1,000 acres or more are concerned, please give details of each block in the form at Appendix 'A' attached.

7. Have any colonization and resettlement operations been carried out in your State during the last 10 years? If so, please give details of areas colonized and resettled, the number of persons resettled, the location of the colonized areas, terms of allotment, and whether the colonization has been successful. The extent of financial assistance given to settlers may also be indicated.

8. Any other remarks that the State Government may like to make in the light of the terms of reference of the Committee.

(Where blocks of 1,000 acres or more lie contiguously, a single form can be used for the entire area; otherwise separate forms should be used for each block of land).

1. Where is the block located? (Here mention the nearest village or town and the Revenue Tehsil in which the block is located).
2. Is the area included in any Community Development Block? If so, please give the name of the Block.
3. What is the nearest Railway Station and the distance of the Station from the block?
4. What is the nearest Post Office and the distance of the Post Office from the block?
5. What is the nearest Telegraph Office and the distance of the Telegraph Office from the block?
6. Is the block connected by road with adjoining villages and towns?
7. If so, is the road fair-weather or all-weather?
8. What is the total area of the block? (If possible, please also supply a map of the block).
9. How much of the area belongs to Government or is with the Panchayats?
10. How much of the area is privately owned?
11. Is it necessary to acquire the whole or part of the land which is privately owned, in order to carry out the colonization operations in the block successfully?
12. If so, what would be the likely cost of acquisition?

it be necessary to do some reclamation work before it could be allotted?

14. If reclamation work is necessary, indicate whether the land is infested with jungle or with weeds or with shrubs and bushes.
15. Whether the land could be reclaimed with the use of manual labour or will it require reclamation by heavy tractors? If the former, is adequate labour locally available?
16. If there are no trees or weeds or shrubs and bushes on the land, is the land eroded? If eroded, please indicate the extent of erosion and the soil conservation measures necessary to make it fit for cultivation.
17. What would be the approximate cost of reclamation or soil conservation per acre of land in the block?
18. What is the type of soil in the block? (alluviums, black, red or lateritic).
19. Is the land flat or gently sloping or steep? What is the depth of the soil?
20. What crops are grown in the area round about the block?
21. What is the yield per acre of each crop?
22. What is the nearest marketing centre for these crops?
23. What is the extent and distribution of rainfall in the area?
24. Can irrigation facilities be made available for the block? If so, what kind of facilities?
25. Whether these irrigation facilities will be perennial or non-perennial?
26. If no irrigation facilities exist at present, whether any irrigation projects likely to be taken up in Third Five Year Plan will cover this land?

28. Are anti-malarial operations necessary in the area for sucessful colonization?

29. Is any endemic disease prevalent in the area? If so, do the State Government contemplate any measures to combat this disease?

30. Is drinking water available in the block?

31. Are there, any drinking water wells in use?

32. Is the area subject to depredations of wild animals? If so, what animals?

33. Is the block likely to attract settlers from distant places in the State or from other States?

34. If the block is not likely to attract settlers from distant places in the State or from other States, what kind of settlers would you recommend for colonization of the block?

35. Do you think educated unemployed could be successfully settled in the block?

36. What should be the unit of allotment per settler?

37. Would you suggest that the settlers should put up their homesteads on allotted lands, or would you like to set up *abadis* for them? If the latter, what should be the unit of allotment for residential purposes in the village *abadi* ?

38. Would it be necessary to organise any training for the settlers, before they are allotted land? (the settlement will be on cooperative basis).

39. Any other details which you may like to give in the light of the terms of reference.

GOVERNMENT OF INDIA
MINISTRY OF FOOD AND AGRICULTURE
Department of Agriculture. 'Krishi Bhavan'

New Delhi, January 2, 1960
Paus 12, 1881.

Dear Shri

Kindly refer to my letter of even number dated the 10th August 1959, with which a copy of the questionnaire issued by the Committee was forwarded to you.

2. According to the questionnaire, the State Government was required to demarcate blocks of 1,000 acres or more out of the total area under "culturable waste", "permanent pastures and other grazing lands", "miscellaneous trees and groves" and "fallows other than current fallows", and to give full details of the blocks so selected in appendix 'A' attached to the questionnaire. The size of blocks was fixed at 1,000 acres or more as it was felt by the Committee that a sufficient number of blocks of this size would be available in all the States. The information now received from some of the States and our discussions with the Liaison Officers of the States of Madhya Pradesh, Bihar and Orissa have led us to think that the availability of culturable wasteland in blocks of 1,000 acres or more for purposes of reclamation and resettlement may be limited. We have, therefore, decided to collect information as in appendix 'A' to the questionnaire issued with the Committee's letter referred to above, for all blocks measuring 250 acres or more.

3. While obtaining this information from the districts, it may be useful to get a certificate from the district officers that the areas other than those in blocks of 250 acres or more out of the total areas under the categories mentioned in para 2 above, are scattered in bits measuring less than 250 acres.

4. I am to request that urgent steps may kindly be taken to collect the required information in respect of blocks measuring 250 acres or more so that the requisite information is available to the Committee by the 31st January, 1960. In view of the fact that the Committee is required to complete its work within the next six months, it is requested that the information may kindly be obtained on a priority basis by deputing some officials to the different districts, if necessary. This should not, however, delay the despatch of information in regard to blocks measuring 1,000 acres or more, which may have already been collected.

5. It appears that the term 'contiguous' used in Appendix 'A' to the questionnaire sent to the States along with our letter of even number dated the 10th August, 1959, requires elucidation. I may observe that even if a block is interspersed with a few cultivators' holdings or some natural obstructions, it should be considered more or less compact or 'contiguous' so long as the operations for the reclamation of land included in it can be undertaken on an economic basis.

Yours sincerely,

(Sd.) B. N. Uppal

All Liaison Officers in the States and Union Territories.

सत्यमेव जयते

APPENDIX D

Average yield (in lb.) per arce of the principal crops in the Punjab.

District	Crops											
	Rice	Wheat	Jowar	Bajra	Barley	Maize	Gram	Sugar-cane	Cotton		Sesamum	Rape & mustard
									Deshi	American		
Hissar	1,045	1,129	61	287	765	897	704	2,796	149	177	68	326
Rohtak	1,111	1,169	89	318	1,136	897	581	3,594	162	190	71	343
Gurgaon	1,111	1,101	150	382	981	897	517	3,437	134	140	69	329
Karnal	1,111	1,002	86	299	773	1,015	764	2,761	143	175	60	328
Ambala	896	716	95	313	647	802	697	2,375	86	139	94	244
Simla	—	716	—	—	—	897	—	—	—	—	—	—
Kangra	1,263	625	95	—	651	1,205	461	1,286	—	—	123	201
Hoshiarpur	1,187	586	95	301	616	809	541	1,702	85	134	100	352
Jullundur	1,187	691	95	301	1,120	856	480	2,900	133	173	68	391
Ludhiana	1,187	939	95	301	1,070	909	568	3,225	135	161	54	451
Ferozepore	1,012	792	95	315	817	960	675	2,600	218	244	63	372
Amritsar	1,185	837	95	301	850	692	651	2,604	108	122	25	543
Gurdaspur	1,035	630	95	301	754	592	539	2,134	99	128	118	267
Bhatinda	656	660	203	274	508	401	349	2,424	—	1,150	—	278
Kapurthala	832	623	329	411	576	1,269	657	3,360	—	600	—	235
Mohindergarh	—	797	154	128	735	610	115	—	—	—	—	285
Patiala	421	739	531	207	576	420	432	1,900	—	910	—	113
Sangrur	917	697	152	296	444	566	553	1,726	—	1,029	—	226

Sources —(*i*) Punjab Season and Crop Report for the Agricultural Year ending June 1956.

(*ii*) Pepsu Season and Crop Report for the Agricultural Year 1950-51,

APPENDIX E

Land utilisation statistics for the Punjab for the year 1957-58 *(district-wise)*

Sl. No.	District	Total geographical area		Forests	Land not available for cultivation		Other uncultivated land excluding fallow lands			Current fallows	Fallows other than current fallows	Net s
		By professional survey	By village papers		Barren & unculturable lands	Land put to non-agricultural uses	Culturable waste	Permanent pastures and other grazing lands	Land under miscellaneous tree crops, groves not included in area sown			
1.	Hissar ..	.. 34,50,240	34,32,204	322	57,161	90,758	2,08,477	—	—	2,59,084	—	28,
2.	Rohtak	.. 14,90,560	14,92,631	6,221	19,618	1,09,602	97,913	24,854	261	41,530	—	11,
3.	Gurgaon	.. 15,15,520	15,03,772	30,143	67,463	1,77,415	8,233	20,817	257	35,905	703	11,
4.	Karnal ..	.. 19,66,720	19,75,033	3,908	1,57,042	80,958	2,51,678	97,214	4.494	86,493	—	12
5.	Ambala ..	.. 12,58,870	12,52,297	1,33,269	1,26,005	98,968	68,977	15,376	—	56,462	—	7,
6.	Simla ..	.. 5,130	4,833	2,770	1,277	—	94	397	—	28	—	
7.	Kangra	.. 61,24,160	63,95,366	6,62,148	48,33,272	1,56,148	1,20,747	49,337	—	86,852	—	4,
8.	Hoshiarpur	.. 14,80,400	14,21,975	35,813	4,67,509	90,468	24,140	21,457	12,572	46,496	—	7,
9.	Jullundur	.. 8,53,760	8,59,017	208	64,065	42,820	38,596	—	—	70,539	—	6,
10.	Ludhiana	.. 8,46,720	8,46,415	3,334	30,466	55,608	66,472	1,733	—	49,331	—	6,
11.	Ferozepore	.. 26,28,480	26,17,693	—	1,93,140	—	1,35,103	—	—	3,27,329	7,106	19,
12.	Amritsar	.. 12,41,600	12,55,954	943	12,187	1,57,363	1,45,284		—	84,852	—	8,
13.	Gurdaspur	.. 8,72,320	8,54,518	9,309	1,49,000	620	69,089	—	526	1,09,659	—	5,
14.	Bhatinda	.. 14,44,480	15,85,258	422	69,579	—	39,585	—	—	14,739	—	14,
15.	Kapurthala	.. 4,03,200	4,11,550	168	2,450	54,787	45,102	—	2.788	47,607	3,760	2,
16.	Mohindergarh	8,59,520	8,57,718	981	—	71,785	63,230	—	—	12,618	—	7,
17.	Patiala ..	.. 16,67,200	15,80,115	33,832	1,48,818	63,954	3,24,509	—	—	46,191	—	9,
18.	Sangrur ..	.. 20,60,800	19,36,570	2,216	1,16,854	—	1,01,690	—	—	71,870	—	1
	Total	.. 3,01,19,680	3,02,82,919	9,26,007	65,15,906	12,51,254	18,08,919	2,31,185	20,898	14,47,585	11,569	1,8

APPENDIX F

Statement showing details of blocks in categories I and II offered for reclamation.

District	Name of block	Block No.	Nearest railway station	Accessible by fair/all-weather road	Whether included in C.D. Block	Area (acres)	Estimated cost of acquisition per acre (Rs.)	Amount of rainfall (inches)	Depth & Nature of sub-soil water	En di
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(1
					Category I					
Karnal	Gulha	1.	Kaithal	All-weather	Yes	15,000	500	18	25′—30′, sweet	N
Hissar	Ottu	2.	Sirsa	No roads	No	15,000	400—500	13	Deep, brackish to sweet	N
Hissar	Fatehabad	3.	Sirsa	All-weather	Yes	5,000	400—500	13	Deep, brackish to sweet	N
Hissar	Tohana	4.	Sirsa	All-weather	Yes	5,000	400—500	13	Deep, brackish to sweet	N N
Patiala	Harchandpura	5.	Patiala	Fair weather	Yes	1,500	500	30	5′—6′, sweet	N
Rohtak	Gujjar Kheri	6.	Ganaur	Fair weather	Yes	350	500	16	6′—8′, sweet	N
					Category II					
Amritsar	Patti	7.	Patti	Fair weather	Yes	7,000	800	16—20	3′—5′, sweet	N
Amritsar	Verowal	8.	Beas	All-weather	Yes	2,500	800	16—20	3′—5′, sweet	
Amritsar	Ajnala	9.	Amritsar	All-weather	No	15,000	800	16—20	3′—5′, sweet	N
Jullundur	Sangowal	10.	Shakkot Malsian	No roads	No	3,000	300	20—25	8′—12′, sweet	N
Jullundur	Talwan	11.	Nurmahal	Fair weather	Yes	3,000	300	20—25	8′—12′, sweet	N
Jullundur	Rahon	12.	Nawan Shahr	All-weather	Yes	5,000	300	20—25	8′—12′, sweet	N
Kapurthala	Kapurthala	13.	Kapurthala	All-weather	Yes	10,000	200—300	20—30	10′—15′, sweet	N
Kapurthala	Sultanpur	14.	Sultanpur	Fair weather	Yes	11,000	200—300	20—30	10′—15′, sweet	N
Kapurthala	Bholath	15.	Dhilwan	Fair weather	Yes	7,000	200—300	20—30	10′—’15′, sweet	N
Kapurthala	Phagwara	16.	Phagwara	All-weather	Yes	2,000	200—300	20—30	10′—15′, sweet	N
Ludhiana	Machhiwara	17.	Khanna	All-weather	Yes	5,000	500	20	5′—6′, sweet	N

APPENDIX F (*contd.*)

Ludhiana	Sidhwan Bet	18.	Jagraon	All-weather	Yes	6,000	150—200	25	4′—5′,	sweet	Nil
Ferozepore	Ferozepore	19.	Ferozepore	All-weather	No	6,000	150	15—16	5′,	sweet	Nil
Ferozepore	Jalalabad	20.	Jalalabad	All-weather	Yes	5,000	200	15—16	5′,	sweet	Nil
Ferozepore	Dharamkot	21.	Moga	All-weather	Yes	4,000	150—200	15—16	5′,	sweet	Nil
Ferozepore	Mallanwala	22.	Mallanwala	Fair weather	No	2,000	150—200	15—16	5′,	sweet	Nil
Gurdaspur	Dera Baba Nanak	23.	Dera Baba Nanak	All-weather	Yes	800	400	35—40	5′—6′,	sweet	Nil
Gurdaspur	Talibpur	24.	Gurdaspur	Fair weather	Yes	1,500	300	35—40	5′—6′,	sweet	Nil
Gurdaspur	Naushera	25.	Gurdaspur	All-weather	Yes	2,000	300	35—40	5′—6′,	sweet	Nil
Gurdaspur	Sri Hargobindpur	26.	Batala	All-weather	Yes	2,000	300	35—40	5′—6′,	sweet	Nil

APPENDIX G

Statement showing the break-down and ownership of the areas in categories I & II offered for reclamation

District	Name of block	Area of block	Percentage of area belonging to			
			Private individuals	Govern-ment	Village panchayats	Cust Eva Prc
	Category I					
Karnal	Guhla	15,000	78—84	1—2	15—20	
Hissar	Ottu	15,000	100	—	—	
	Fatehabad	5,000	100	—	—	
	Tohana	5,000	100	—	—	
Patiala	Harchandpura	1,500	100	—	—	
Rohtak	Gujjar Kheri	350	—	—	100	
	Category II					
Amritsar	Patti	7,000	100	—	—	
	Verowal	2,500	100	—	—	
	Ajnala	15,000	60	—	—	
Jullundur	Sangowal	3,000	25	—	10	
	Talwan	3,000	25	—	10	
	Rohaon	5,000	30	—	10	
Kapurthala	Kapurthala	10,000	25	—	10	
	Sultanpur	11,000	25	—	10	
	Phagwara	2,000	100	—	—	
	Bholath	7,000	30	—	10	

APPENDIX G *(contd.)*

Ludhiana	Machiwara	5,000	40	10	—	50
	Sidhwan Bet	6,000	65	—	5	30
Ferozepore	Ferozepore	6,000	10	—	—	90
	Jalalabad	5,000	—	—	—	100
	Dharamkot	4,000	10	—	—	90
	Malhanwala	2,000	10	—	—	90
Gurdaspur	Dehra Baba Nanak	800	50	—	50	—
	Talibpur	1,500	30	—	30	40
	Naushera	2,000	—	—	20	80
	Sri Hargovindpur	2,000	—	—	20	80

The Governor of Punjab is pleased to make the following amendments in executive instructions contained in Notification No. RD-1(42) SS/56/24, dated the 28th May, 1956, known as Nazool lands (Transfer), Rules, 1956, issued by the Revenue Department of the erstwhile State of Pepsu and amended under Punjab Government Notification No. JS/57/1835, dated 8th May, 1957.

1. For Rule 3, the following shall be substituted, namely :—

Rule 3, *Transfer of Nazool lands*

In a village where Nazool land available is less than 10 acres and is being leased to members of Scheduled castes, it may be allotted to the present lessees individually up to the limit of a unit of Nazool land, provided they do not own any land of their own. Those who own some land, they may be allowed such area as would make up the unit of Nazool land as defined in the rules, when added to their own land, and the rest may be allotted to others.

(*b*) In the villages where Nazool land available is 10 acres or more, the Scheduled castes land owning Co-operative Societies may be formed by the heads of Scheduled Castes families in accordance with these rules, and the Nazool land may be allotted to them. If a Co-operative Society cannot be formed, then the Nazool land may be allotted to present lessees *i.e.* members of Scheduled Castes individually up to the unit of Nazool land as defined in the rules provided they do not own any land of their own. Those who own some land, they may be allowed such area as would make up the unit of Nazool land when added to their own area and the rest may be allotted to other members of Scheduled Castes.

(*c*) Nazool lands already under self-cultivation of landless persons of backward classes may be allotted to them, like members of Scheduled Castes in the manner prescribed at (*a*) and (*b*) above.

3-A *Mortgaged Nazool lands*

In the case of Nazool lands mortgaged with possession the mortgagers' rights be transferred to the Co-operative Society of Scheduled Castes, where the land is 10 acres or more, and to the individual members of Scheduled Castes where it is less than 10 acres, in the manner prescribed in rule 3(*a*) and (*b*) and the mortgagers should pay the entire mortgage amount which would be deemed as equal to the sale price of the land, in cases where mortgage money exceeds the price to be charged by Government under rules. Where the mortgage amount is less than the price to be charged according to the rules, the difference between the two amounts should be paid to the Government and the mortgage money to the mortgagees.

lands in the Punjab, described in the particulars hereunto annexed, and marked Schedule 'A', notice is hereby given that the plans of the said lands are open to inspection, free of charge, at the office of the Deputy Commissioners up to————————. The conditions under which the land will be held are specified in Schedule 'B' annexed.

2. The area of the lands and other particulars are given in the statement attached and marked Schedule 'A'. The following categories of persons will be eligible for selection as grantees :—

(*i*) Persons whose lands have gone over to Pakistan side due to river action of Ravi and Sutlej,
(*ii*) Self-cultivating owners whose cultivable holding has been reduced to less than 5 acres on account of effect of water-logging and erosion due to river action,
(*iii*) Rai Sikhs (only for Border areas),
(*iv*) Landless tenants, both Harijans and others,
(*v*) Ex-servicemen, and
(*vi*) Graduates of Agricultural College.

3. The unit of allotment will be 15 acres of culturable land or 20 acres of culturable Banjar land and in the case of Graduate grantees 50 acres of culturable Banjar land.

4. Joint farming shall have to be done at least by four contiguous grantees.

Applicable to graduate grantees only

5. A Co-operative Society shall have to be formed for each village. A copy of Business bye-Laws of the Co-operative Society is also available for inspection, in the office of the Deputy Commissioner.

6. The Grantee will not be liable to pay land revenue, rates and cesses or lease money for the first five years from the commencement of the tenancy. He will, however, be required to pay *abiana,* where canal irrigation facilities are made available to him. After the expiry of five years, single time land revenue, *abiana* and other cesses will be charged on such grants.

7. After the expiry of 10 years, the land will be transferred to the grantee at the rate of Rs. 100 per acre in a lump sum.

8. In case the grantee does not wish to purchase the land, it will be resumed without giving any compensation whatsoever for the improvement made by him. In the event of such resumption the allottee will give vacant possession of the land.

9. No exchange of land from one village to the other, or from the Tehsil to the other, or even from the district to the other will be allowed in any circumstances.

SCHEDULE 'B'

Statement of conditions covering grants of inferior land for improvement

1. This statement of conditions is issued subject to the provisions of the Colonisation of Government lands (Punjab) Act, 1912, hereinafter referred to as "the act aforesaid", and in pursuance of the provisions of section 10(2) thereof.

2. No person shall be entitled as of right to become tenant, that is to say, the State Government hereby reserve to itself and retains absolute discretion in the selection of tenants for the lands referred to in this statement.

3. In this statement of conditions :—

(*a*) "The lands" and "the said lands" shall, so far as each separate tenancy is concerned, be deemed to apply to and designate the lands included in that tenancy,

(*b*) "the date of commencement of the tenancy" means the date of the written order referred to in sub-section (3) and (4) of section 10 of the said Act,

(*c*) "Collector" and "Commissioner" shall have the meaning assigned to them in section 3 of the said Act,

(*d*) "Improvements" means improvements as defined in clause (19) of section 4 of the Punjab Tenancy Act, 1887.

Size of grant

4. Tenant receiving a grant of lands in accordance with these conditions will receive a grant not exceeding 20 acres of cultivable banjar land.

5. The tenant shall have to do joint farming with three other contiguous grantees.

6. A Co-operative Society shall be formed by the allottees of each village and Business bye-Laws of this society, a copy of which is enclosed, shall be binding on each grantee. In case of breach, the tenancy shall be liable to resumption.

Reservation by Government

7. The State Government does not grant to the tenant but hereby absolutely excepts and reserves to itself out of land in respect of the said lands.

(*i*) All grounds situated in the said lands or any part thereof already marked out, excavated or otherwise utilized for the distributary,

(*ii*) All existing rights to and over all mines and minerals, coals, gold-washings, earth-oil and quarries in or under the said lands or any part thereof.

8. The tenant shall at all times permit any officer or officers of the Government to enter into and upon the whole or any part of the lands and do all acts and things that may be necessary or expedient for the purpose

of searching for working, getting or carrying away any such mines and minerals, coals, gold-washings, earth-oil and quarries.

Compensation for damage occasioned by exercise of Government Powers

9. The State Government agrees to pay to the tenant reasonable compensation for any damage at any time directly occasioned by the exercise by the State Government of all or any of the rights reserved to itself in clause 7 and clause 8 other than existing rights of way and water and other easements.

10. The State Government does not grant to the tenant, but hereby absolutely excepts and reserves all roads situated in the said lands or any part thereof which have been marked out on the ground or delineated in the plan or plans kept in the office of the Collector.

And it like-wise excepts and reserves the right of the Public to traverse a width of 3 Kadams (16½ ft.) along one side of the lines bounding 25 acres rectangles wherever this way be considered necessary in the Public interest by the Collector and also to traverse a width of 3 Kadams (16½ ft.) otherwise situated wherever the Collector considers this necessary in order to replace an existing thoroughfare and the tenant is prohibited from cultivating or otherwise obstructing the thoroughfare so provided.

11. The tenant shall at all times, on receipt of a requisition in writing signed by the Collector, permit the said Collector to take possession of and finally to resume for the Government, so much of the said lands as may from time to time, in the opinion of the said Collector, be required for construction, repairs or maintenance of railways, roads, water-courses or any works connected therewith.

12. No compensation shall be claimable by the tenant or any person in respect of such reservation or resumption as is referred to in clauses 10 and 11 but in respect of any area so reserved no occupiers' rates, land revenue, or cesses shall be payable by the tenant.

Cost of Survey, demarcation, roads and culverts.

13. The tenant shall be chargeable with the whole of the cost of the survey and demarcation of the said land, together with his share of the cost of the water-course or water-courses of the estate in which the said lands are situated, and of the roads and culverts necessary for the general convenience of correspondents of each estate, and also with the cost of keeping such roads and culverts in proper repair. The amounts of such charges, as determined by the Government or by the Collector in the case of repairs of roads and culverts, shall be recoverable in such manners and at such time as may be fixed by Government or by the Collector respectively.

Boundary marks

14. The tenant shall duly comply with such directions as the Collector shall from time to time require him to construct boundary marks on the limits of the said lands or any part thereof, and shall keep them when erected in good repair to the satisfaction of Collector.

Responsibilities of tenant with regard to crime

15. The tenant shall render all such assistance in the prevention or discovery of crime as is incumbent on the owners and occupiers of land

inhabitants of villages are under say tract law or rules for the time being in force in the Punjab.

Payment of Land Revenue and other charges

16. No land revenue or other cesses shall be charged from the tenant of the land for the first 5 years. Of course, *abiana* will be leviable where canal irrigation has been extended. After the expiry of 5 years from the harvest in which the possession was taken by the tenant, single land revenue and cesses shall also be chargeable for the next 5 years.

Permanent residence of tenant

17. The tenant shall take up his residence permanently in the estate in which the lands are allotted within six months of the date on which the Collector directs that he be put in possession of specified area of land.

Trees and brush-wood.

18. All brush-wood and trees on the said land shall be at the absolute disposal of the tenant and may be sold out by him.

Improvement

19. The tenant may sink wells, make water-courses, plant trees, build houses and otherwise improve the land, and subject to the due fulfilment by him of the conditions and liabilities set forth in this statement, shall be entitled to all the products of land other than those specified in clause 7 thereof, provided that no water-course shall be made on a plan or in a position not approved by the Irrigation Department, and that every water-course in use shall be kept in proper repair by the tenant to the satisfaction of that Department. In case of resumption of grant for breach of any of the terms and conditions by the grantee, he will not be entitled to any compensation for any improvement made by him.

Cultivation of land

20. The tenant shall not use the said lands or any part thereof in a manner which renders them unfit for the purposes for which he holds them, and shall bring one half of the culturable area thereof under cultivation within three years from the date of commencement of the tenancy and the whole of it similarly reckoned within five years from the same date, and thereafter he shall keep the said lands under cultivation to the extent of one half thereof during each harvest.

The tenant shall cultivate the whole of his land with his own hands, or his successors in interest. Graduate grantees shall be allowed to employ paid labour.

Special conditions for the cultivation of land

21. The tenant shall :—

(*i*) Follow the advice of the Agricultural Department, if given regarding the sowing of improved seeds,

(*ii*) Either purchase pure cotton seed annually from the Agricultural Department its seed agencies or retain in hand sufficient *kapas* of improved varieties from his own produce to provide his seed requirement for the succeeding year, (*iii*) Provide and use improved implements on the following minimum scale per square or rectangle.

Applicable to graduate grantees only

- (*a*) One furrow-turning plough, Rajah or Chattamooga,
- (*b*) One bar harrow,
- (*c*) One kharif drill,
- (*d*) One rabi drill (preferably of the automatic type, in which case one per two squares of rectangles will be sufficient).

(*iv*) Maintain two pairs of bullocks per square or rectangle of land allotted,

(*v*) Sow all wheat and cotton crops by drill in lines as recommended by the Agriculture Department,

(*vi*) Break up initially all land after harvest by using a furrow-turning plough,

(*vii*) Green manure annually not less than two acres per square or rectangle,

(*viii*) Store all farmyard manure carefully in a properly constructed pit or pits and either collect in the same pit or compost in a separate pit or pits all available waste matter on the holding,

(*ix*) Adopt at his own cost such measures as are recommended by the Agricultural Department for the control of insect pests and crop diseases.

Tenancy liable to resumption in convictions of tenant

22. If the tenant has been convicted of any non-bailable offence, or has been ordered under section 112 of the code of criminal procedure, to execute a bond to be of good behaviour or is adjudged by the Collector to be guilty of other misconduct which renders him unfit to remain a grantee of land, he shall be deemed to have committed a breach of these conditions and his allotment shall be liable to cancellation under the orders of the Collector of the district.

23. At or after the expiration of 10 years from the date of the commencement of the tenancy, the tenant, having duly paid all sums due to Government under the conditions herein before described and having duly observed all the stipulations herein contained and to be observed by him, shall be entitled to purchase the said land at the rate of Rs. 100 per acre in a lump sum.

24. In case, the grantee does not wish to purchase the land, it will be resumed. In such an event, the grantee shall not be entitled to any compensation, whatsoever, for the improvements made by him and shall give vacant possession of the land allotted to him.

Arbitration

25. In the event of any dispute arising between the Government and the tenant during the currency of the tenancy as to any matter in any way relating to the property and rights of Government or as to any matter or thing any way connected with it, the dispute shall be referred to the Commissioner of the Division. Appeal against his order will be with the State Government, whose decision shall be final.

Sl. No.	Name of the District		Tehsil		Area (bighas)								
					Banjar Qadim			Ghair Mumkin			Total		
1.	Jullundur	..	1. Jullundur		28	7	17	6	7	0	35	6	17
			2. Nakodar		2,061	3	5	866	6	7	2,928	1	12
			3. Nawanshahar		1,874	5	8	2,763	1	4	4,637	6	12
			4. Phillaur		1,317	0	0	7,016	6	7	8,333	6	7
			Total	..	5,282	0	10	10,653	4	18	15,935	5	8
2.	Ludhiana	..	1. Ludhiana		4,556	3	3	318	4	17	4,875	0	0
			2. Jagraon		1,667	1	11	15	1	2	1,682	2	13
			3. Samrala		1,370	6	4	606	3	7	1,977	1	11
			TOTAL	..	7,594	2	18	940	1	6	8,534	4	4
3.	Ferozepore	..	1. Ferozepore		1,821	7	13	294	7	2	2,116	6	15
			2. Moga		0	5	18	0	0	17	0	6	15
			3. Zira		4,039	5	11	634	1	2	4,673	6	13
			4. Mukatsar		—			—			—		
			5. Fazilka		2,004	0	3	630	3	9	2,634	3	12
			TOTAL	..	7,866	3	5	1,559	4	10	9,425	7	15
4.	Amritsar	..	1. Amritsar		109	4	17	90	4	0	200	0	17
			2. Tarn Taran		112	5	8	207	4	19	320	2	7
			3. Patti		223	7	0	0	2	0	224	1	0
			4. Ajnala		4,792	0	19	590	6	11	5,382	7	10
			TOTAL	..	5,238	2	4	889	1	10	6,127	3	14
5.	Gurdaspur	..	1. Gurdaspur 2. Pathankot 3. Batala		304	0	11	58	2	0	362	2	11
			TOTAL	..	304	0	11	58	2	0	362	2	11
6.	Kangra	..	1. Kangra		66	0	10	6	7	17	73	0	7
			2. Nurpur		313	7	3	255	5	4	1,069	4	7
			3. Dehra		418	6	10	52	3	15	471	2	5
			4. Palampur		658	4	13	0	5	8	659	2	1
			5. Hamirpur		467	0	0	111	6	0	578	6	0
			TOTAL	..	2,424	2	16	427	4	4	2,851	7	0
7.	Hoshiarpur	..	1. Hoshiarpur		3,201	3	1	1,670	6	17	4,872	1	18
			2. Garhshankar		1,347	4	4	482	6	18	1,830	3	2
			3. Una		694	1	0	240	3	4	934	4	4
			4. Dasuya		71	3	3	787	3	6	858	6	9
			TOTAL	..	5,314	3	8	3,181	4	5	8,495	7	13
			GRAND TOTAL	..	34,023	7	12	17,709	6	13	51,733	6	5

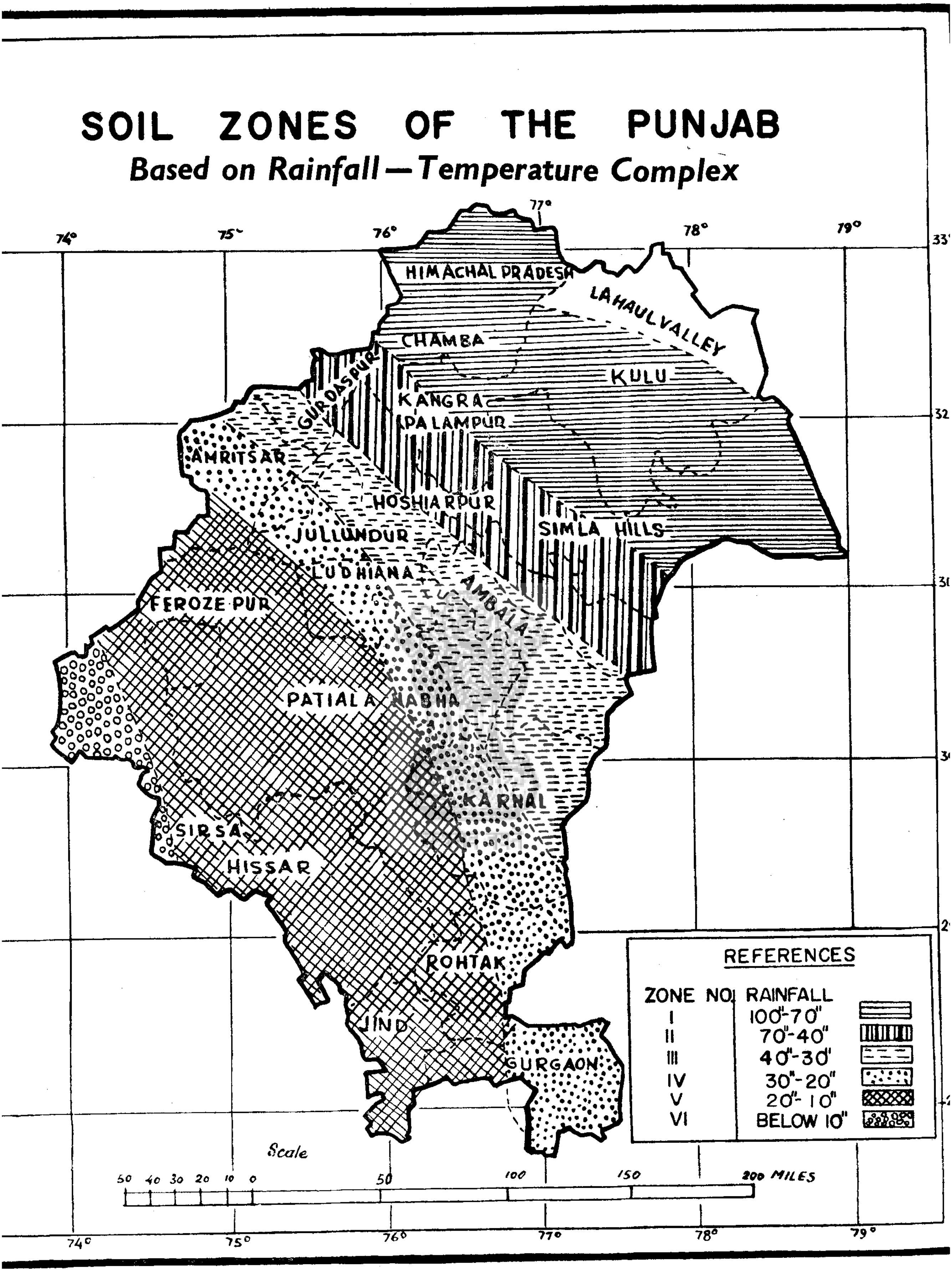
Sl. No.	District	Tehsil	Area (bighas)		Total
			Banjar Qadim	Ghair Mumkin	
1.	Ambala ..	.. 1. Ambala	457 7 5	526 2 8	984 1 13
		2. Jagadhri	502 3 12	1,921 1 16	2,423 5 8
		3. Narain Garh	1,146 7 19	3,120 7 10	4,267 7 9
		4. Ruper	1,218 6 15	1,242 5 15	2,461 4 10
		5. Nalagarh	292 2 10	7 6 4	300 0 14
		6. Kharar	736 3 19	4,987 6 13	5,724 3 12
		TOTAL ..	4,355 0 0	11,806 6 6	16,161 6 6
2.	Hissar ..	.. 1. Hissar	159 7 4	26 7 6	186 6 10
		2. Bhivani	366 5 0	463 5 0	830 2 0
		TOTAL ..	526 4 4	490 4 6	1,017 0 10
3.	Rohtak	.. 1. Rohtak	31 5 12	4 4 15	36 2 7
		2. Gohana	205 6 0	95 7 15	301 5 15
		3. Jhajar	367 5 5	16 0 0	383 5 5
		4. Sonipat	3 7 18	35 3 6	39 3 4
		TOTAL ..	609 0 15	151 7 16	761 0 11
4.	Karnal ..	.. 1. Karnal	2,909 2 8	2,065 3 5	4,974 5 13
		2. Panipat	23 0 0	75 1 0	98 1 0
		3. Thanasar	154 7 16	926 5 7	1,081 5 3
		4. Kaithal	898 3 8	847 1 17	1,745 5 5
		TOTAL ..	3,985 5 12	3,914 3 9	7,900 1 1
5.	Gurgaon	.. 1. Gurgaon	1,023 2 0	142 7 14	1,166 1 14
		2. Palwal	173 1 7	10 0 10	183 1 17
		3. Nuh	249 5 0	3 7 10	253 4 10
		4. Ferozepore Jhirka	225 4 8	35 4 11	261 0 19
		5. Rewari	12 4 0	677 0 0	689 4 0
		6. Balabgarh	247 7 18	205 4 18	453 4 16
		TOTAL ..	1,932 0 13	1,075 1 3	3,007 1 16
		GRAND TOTAL	11,408 3 4	17,438 7 0	28,847 2 4

Table showing surplus inferior evacuee land in Patiala Division

Sl. No.	District	Tehsil	Area (bighas) Banjar Qadim			Area (bighas) Ghair Mumkin			Total	
1.	Patiala ..	1. Patiala	299	0	13	24	1	0	323	1
		2. Narwana	10	0	16	143	1	0	153	1
		3. Nabha	32	4	17	—			32	4
		4. Rajpura	16	6	0	41	1	10	57	5
		5. Kandaghat	253	4	14	118	5	13	372	2
		TOTAL ..	612	1	0	327	1	3	939	2
2.	Sangrur.. ..	1. Sangrur	60	2	17	14	4	7	74	7
		2. Jind	11	3	10	60	7	0	72	2
		3. Sunam	4	0	10	2	1	0	6	1
		4. Barnala	40	1	14	38	4	9	78	6
		5. Malerkotla	254	6	10	0	3	17	255	2
		TOTAL ..	370	7	1	116	4	13	487	3
3.	Mohindergarh	1. Narnaul	33	6	0	—			33	6
		2. Cherkhi Dadrai	24	6	0	0	0	7	24	6
		TOTAL ..	58	4	0	0	0	7	58	4
4.	Bhatinda ..	1. Bhatinda	1	0	19	1	2	14	2	3
		TOTAL	1	0	19	1	2	14	2	3
5.	Kapurthala ..	1. Kapurthala	391	5	16	535	1	15	926	7
		2. Phagwara	16	5	13	3	7	6	20	4
		TOTAL	408	3	9	539	1	1	947	4
		GRAND TOTAL	1,451	0	9	984	1	18	2,435	2

L6MofF&A—500—20-1-61—(Sec. II)—GIPF.

MAP I



SOIL ZONES OF THE PUNJAB

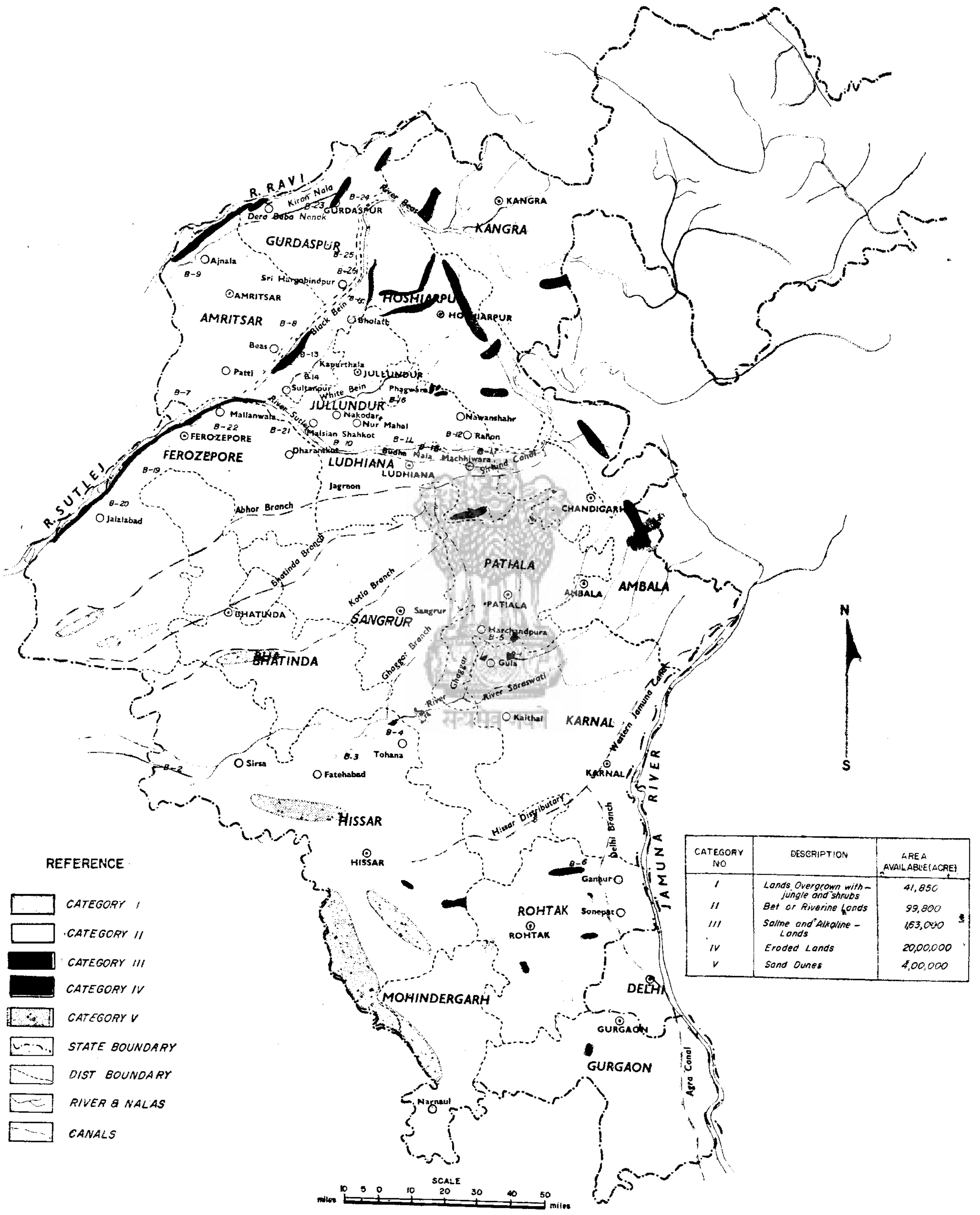
Based on Rainfall—Temperature Complex

MAP II

PUNJAB

AP SHOWING LOCATION OF WASTELANDS

(IN BLOCKS OF 250 ACRES OR MORE)

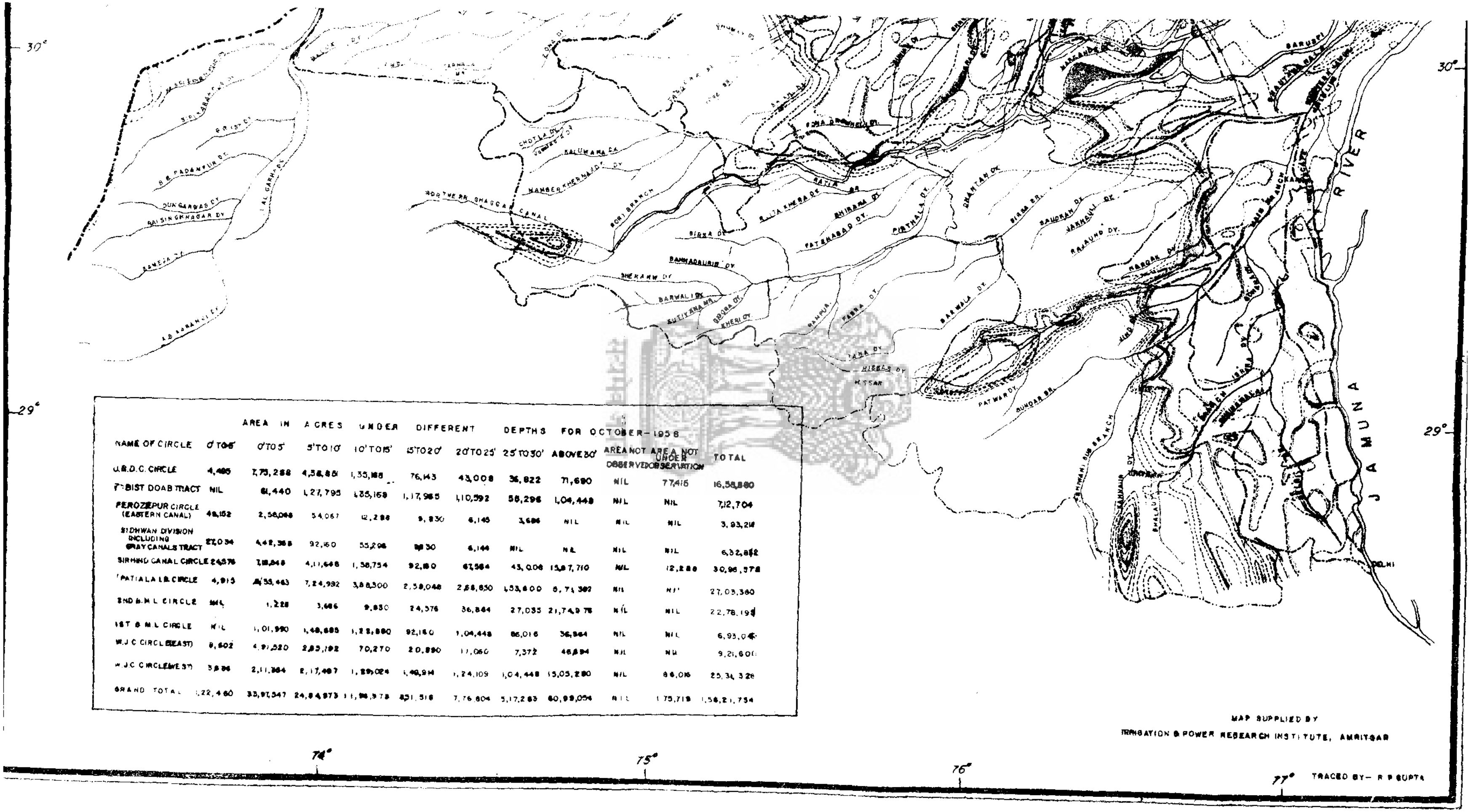


REFERENCE

- ☐ CATEGORY I
- ☐ CATEGORY II
- ▬ CATEGORY III
- ■ CATEGORY IV
- ▨ CATEGORY V
- STATE BOUNDARY
- DIST BOUNDARY
- RIVER & NALAS
- CANALS

CATEGORY NO	DESCRIPTION	AREA AVAILABLE (ACRE)
I	Lands Overgrown with jungle and shrubs	41,850
II	Bet or Riverine Lands	99,800
III	Saline and Alkaline Lands	1,63,000
IV	Eroded Lands	20,00,000
V	Sand Dunes	4,00,000

REPRODUCED AT
Cartographic Laboratory, I.A.R.I., New Delhi-12.

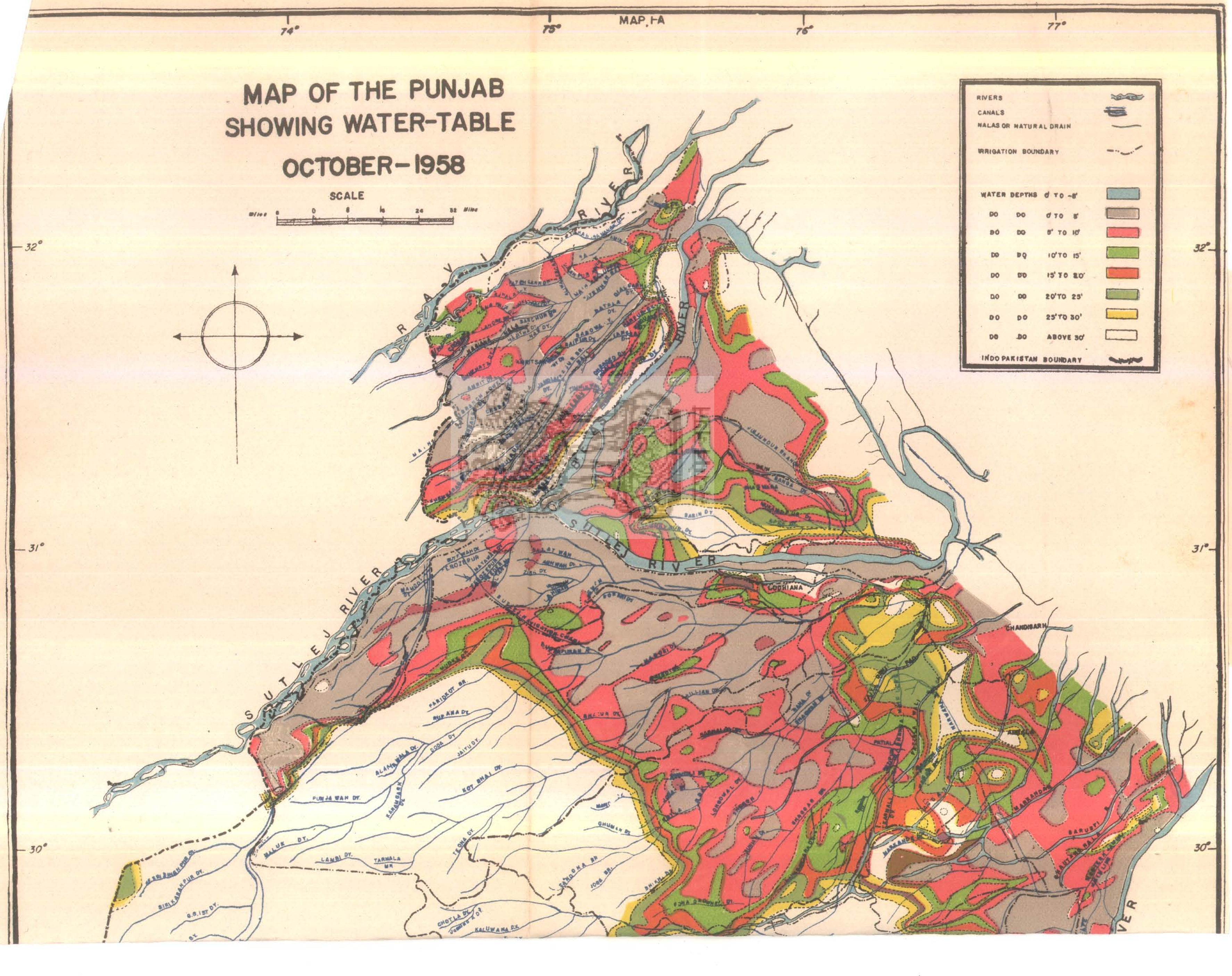


AREA IN ACRES UNDER DIFFERENT DEPTHS FOR OCTOBER-1958

NAME OF CIRCLE	0' TO 0'	0' TO 5'	5' TO 10'	10' TO 15'	15' TO 20'	20' TO 25'	25' TO 30'	ABOVE 30'	AREA NOT OBSERVED	AREA NOT UNDER OBSERVATION	TOTAL
U.B.D.C. CIRCLE	4,485	7,73,288	4,38,881	1,35,188	76,143	43,008	36,822	71,690	NIL	77,416	16,58,880
7-BIST DOAB TRACT	NIL	81,440	1,27,795	1,35,169	1,17,985	1,10,592	58,296	1,04,448	NIL	NIL	7,12,704
FEROZEPUR CIRCLE (EASTERN CANAL)	48,152	2,56,066	54,067	12,288	9,830	6,145	3,686	NIL	NIL	NIL	3,93,218
SIDHWAN DIVISION INCLUDING GRAY CANALS TRACT	27,034	4,42,368	92,160	55,296	9,830	6,144	NIL	NIL	NIL	NIL	6,32,852
SIRHIND CANAL CIRCLE	24,576	7,18,848	4,11,648	1,38,754	92,160	67,584	43,008	15,87,710	NIL	12,288	30,96,578
PATIALA L.B. CIRCLE	4,915	11,33,463	7,24,992	3,88,300	2,58,048	2,88,650	1,53,600	5,71,392	NIL	NIL	27,03,360
2ND B.M.L CIRCLE	NIL	1,228	3,686	9,830	24,576	36,864	27,035	21,74,978	NIL	NIL	22,78,198
1ST B.M.L CIRCLE	NIL	1,01,990	1,48,685	1,22,880	92,160	1,04,448	86,016	36,864	NIL	NIL	6,93,046
W.J.C CIRCLE (EAST)	9,402	4,91,520	2,83,192	70,270	20,890	11,060	7,372	46,894	NIL	NIL	9,21,606
W.J.C CIRCLE (WEST)	3,896	2,11,364	2,17,487	1,29,024	1,40,914	1,24,109	1,04,448	15,05,280	NIL	86,016	25,34,328
GRAND TOTAL	1,22,460	33,97,547	24,84,873	11,86,578	8,31,516	7,76,604	5,17,283	60,99,054	NIL	1,75,719	1,56,21,754

MAP SUPPLIED BY
IRRIGATION & POWER RESEARCH INSTITUTE, AMRITSAR

TRACED BY— R P GUPTA



MAP OF THE PUNJAB SHOWING WATER-TABLE

OCTOBER-1958